

# Chemical Age

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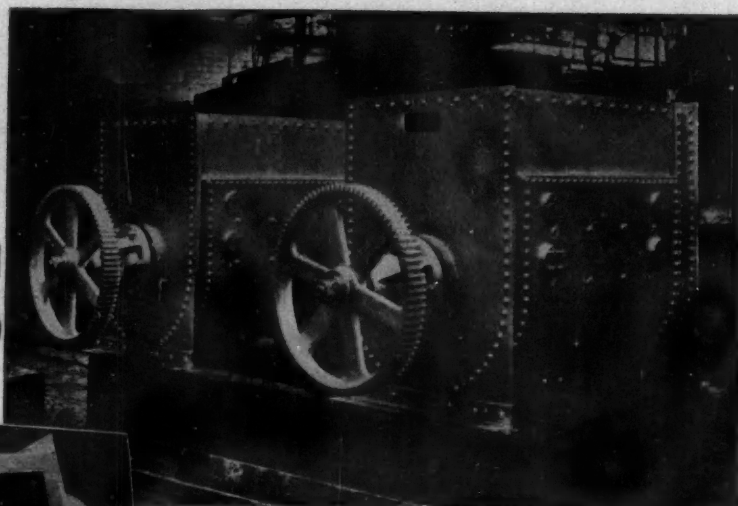
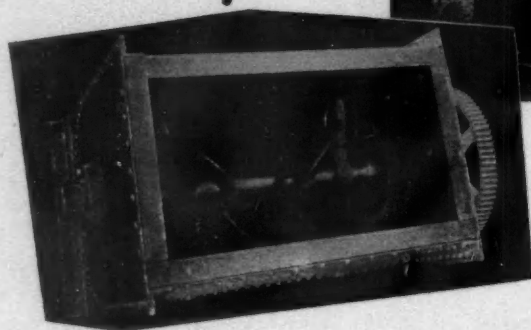


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# MIXING VESSELS



These hot water jacketed Mixing Vessels (capacity  $\frac{1}{2}$  Ton each) are for use in chocolate manufacture.

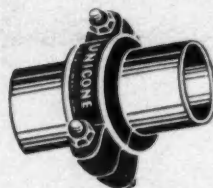
The lower photograph shows the stirring gear.

• • • We manufacture Mixers, Blenders and Process Vessels for a wide range of Industries and applications.

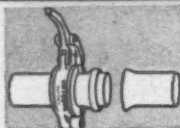
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## INSTANTANEOUS JOINTS

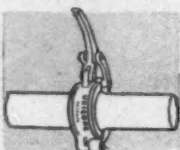
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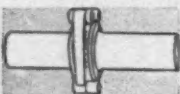
For permanent or semi-permanent pipelines 'UNICONE' bolted pipe joints are employed.



Rubber gasket in position and joint ready to pull over.



Pipe ends joined ready for locking.



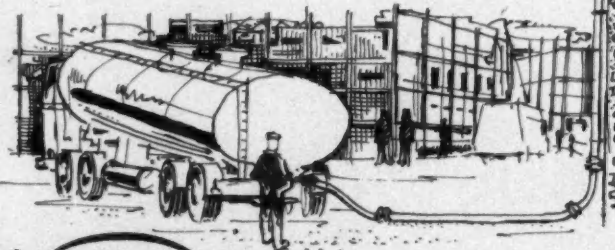
The completed joint.

For temporary pipe lines 'Unicone' instantaneous joints are recommended. Comprising two parts only, they fasten with a "snap" ensuring a perfect seal in a matter of seconds.

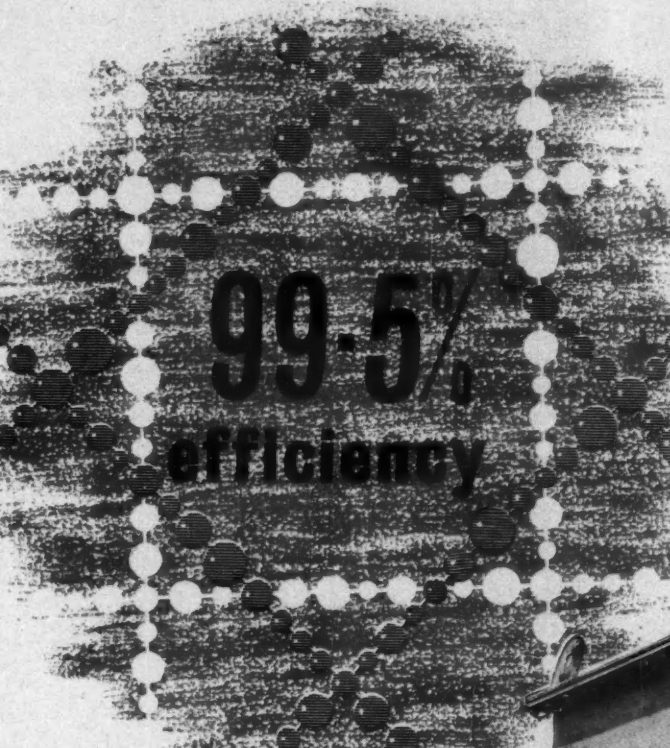
For permanent or semi-permanent pipe lines, 'Unicone' bolted type joints are usually employed and can be assembled far more quickly than any other flexible joint giving positive anchorage.

### A perfect joint in a matter of seconds...

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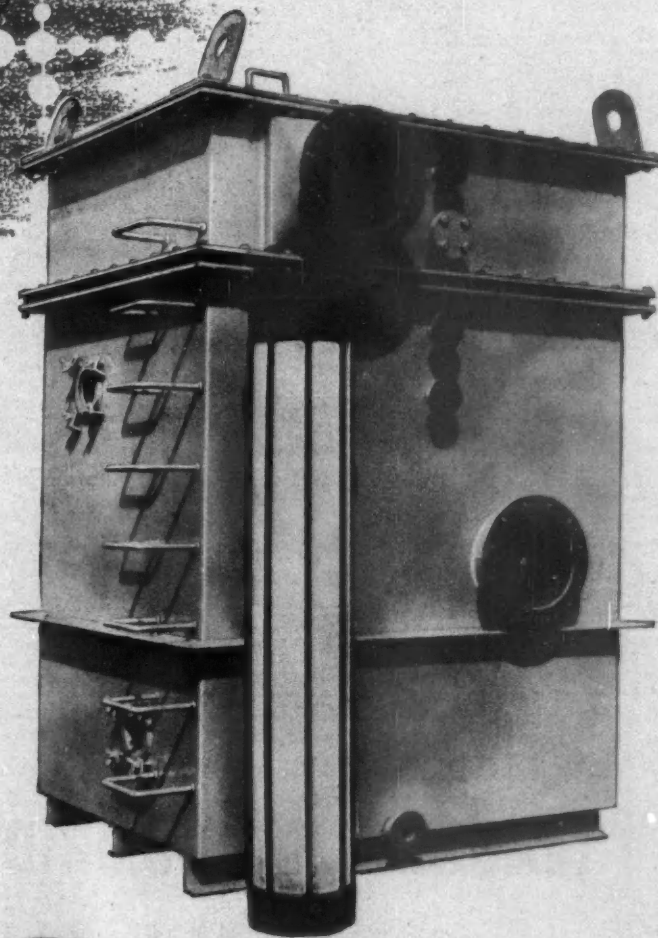
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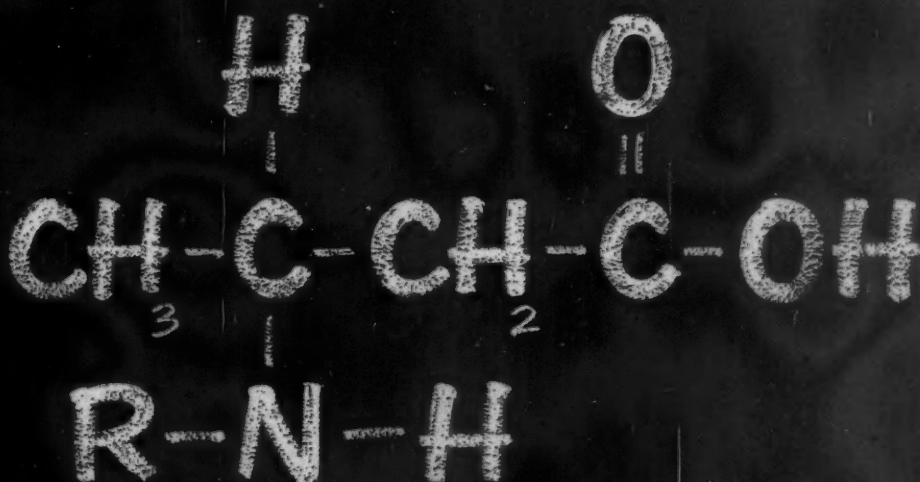
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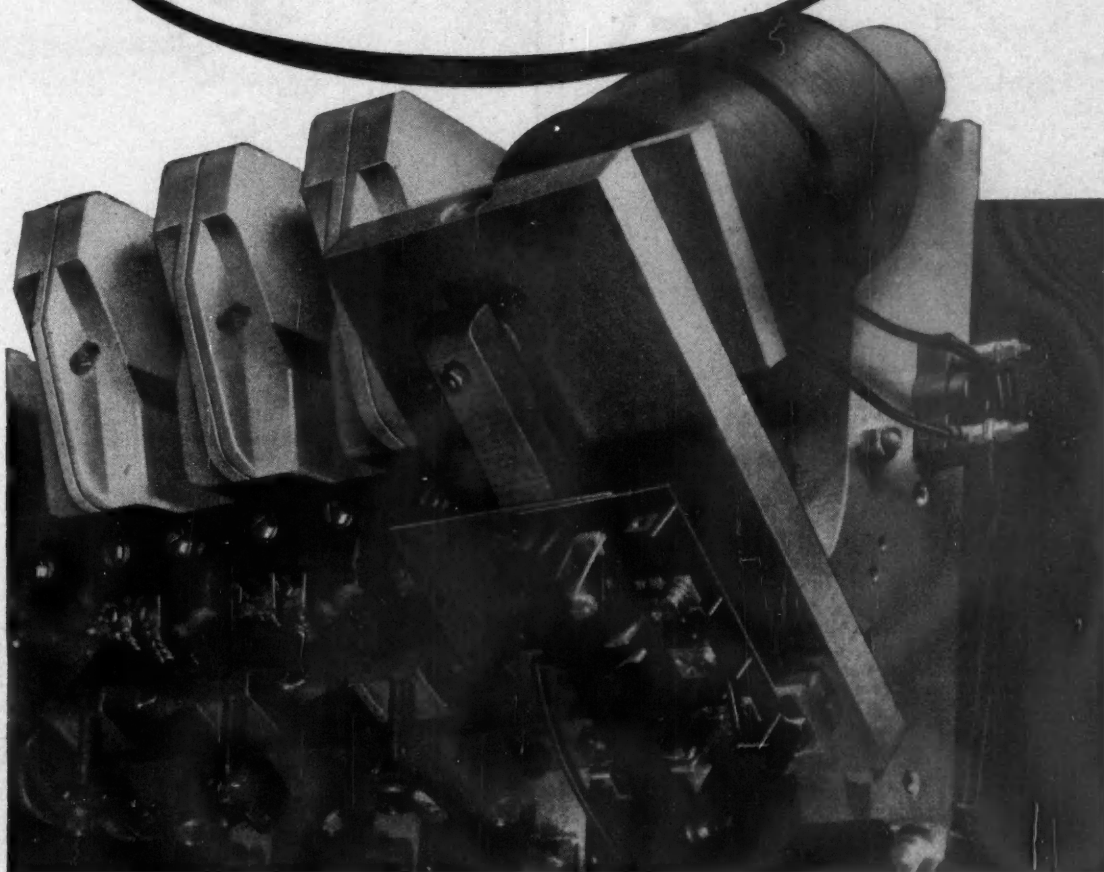
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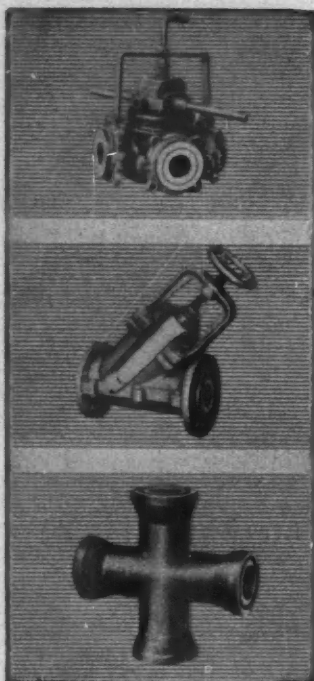


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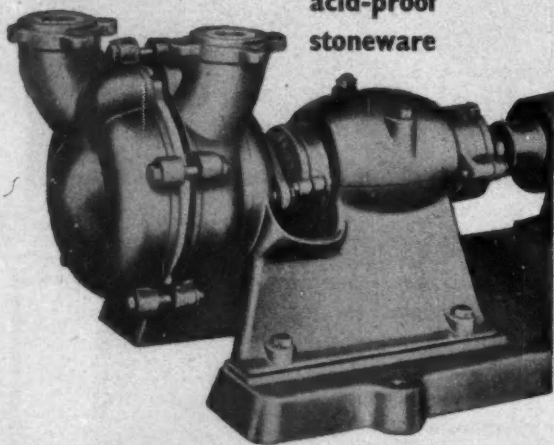
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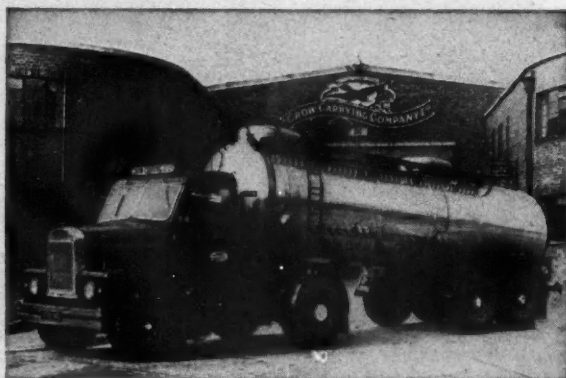
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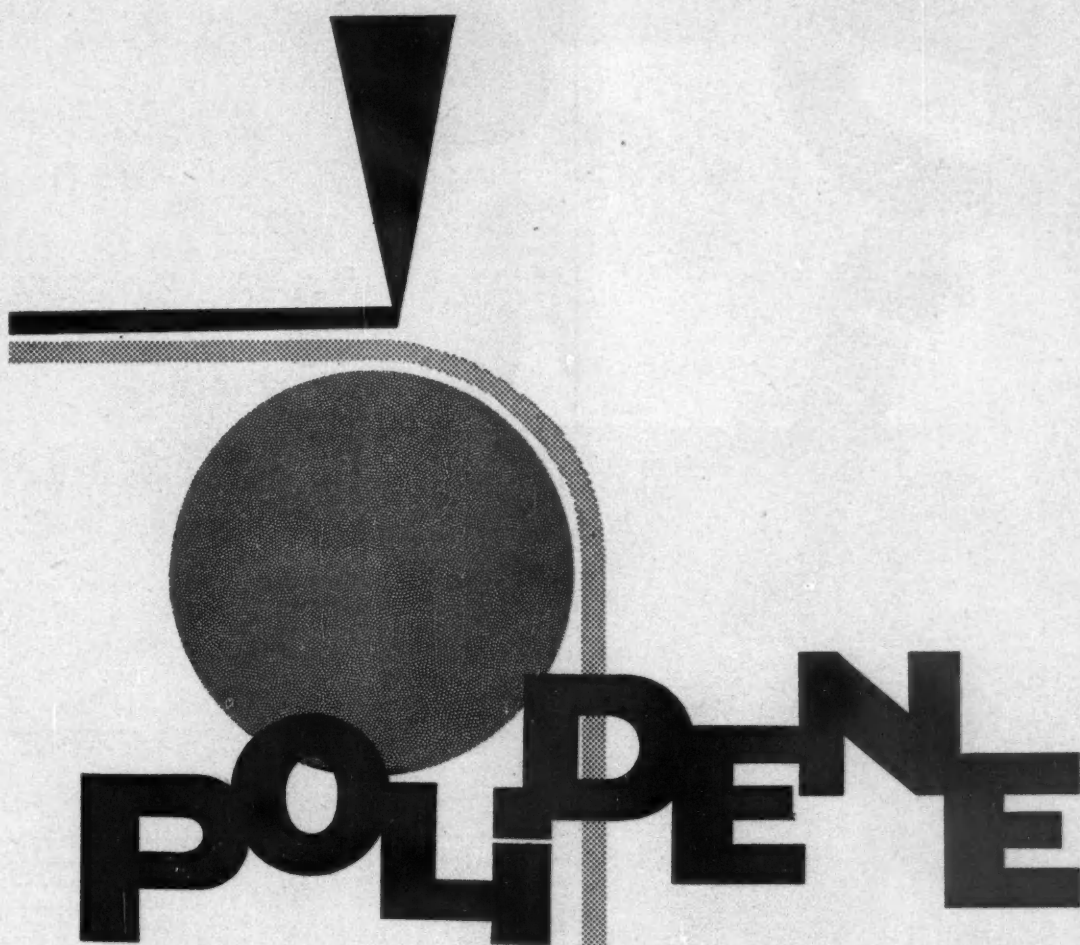
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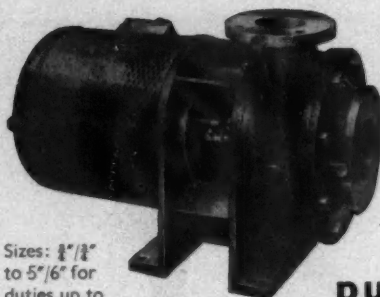
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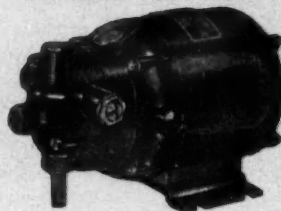
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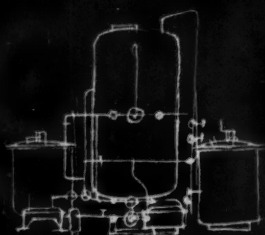
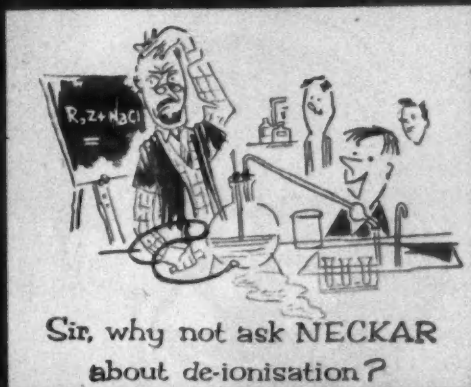
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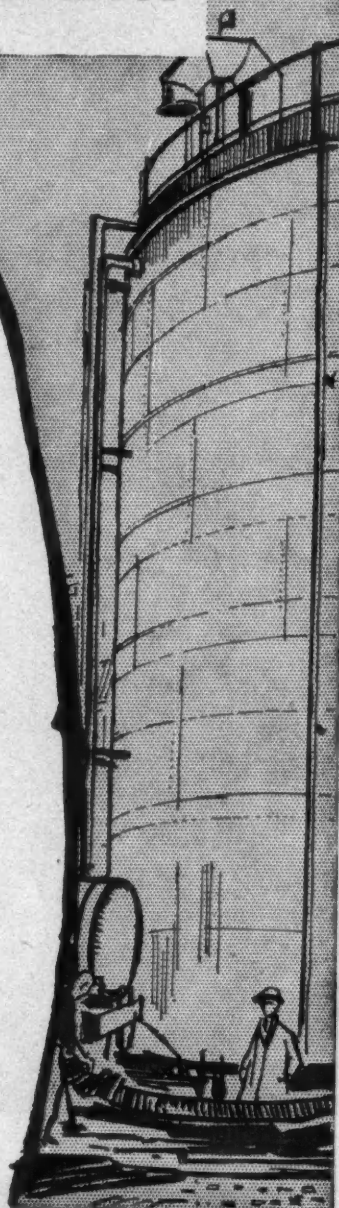
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# Chemical Age

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## WEST GERMAN SLOW-DOWN

**T**URNOVER reports from the West German chemical industry show that the industry, while still "having it good", is not having it quite as good. A slow-down in expansion is impending and profits are becoming harder to come by.

For the first half of the current year the industry reports a total turnover of DM 11,830 million, or some 5% more than that recorded for the corresponding 1960 period. This compares, however, with an increase of as much as 17% for the first 1960 half-year as against the same 1959 period. Production rose by some 8% in the first half of this year over January-June 1960; this was broken up into increases of 3% for inorganic industrial chemicals, 6% for organic industrial chemicals, 9%-plus for 'special chemical products', a group including plastics and synthetic fibres, and 7½% for 'consumer special chemical products'.

Producer price index for the chemical industry which stood at 128 (1950 = 100) for the first half of last year, fell as low as 104 by the end of the first 1961 half-year. Orders received from home customers showed a rising trend over the 1961 period, but those from foreign customers showed a distinct drop.

A thorn that is digging deeper into the industry's side is the recent 5% upward revaluation of the Mark, which has increased foreign competition, while rising labour and other costs along with reduced prices are putting a squeeze on profit margins. Despite this, there is no sign at present of any easing of the present high production rates or of capital expenditure. It is obvious, however, that under present conditions, increasing emphasis must be placed on the highest possible efficiency. A lead has been given here by Farbwerke Hoechst, who, along with the other two I.G. Farben successor companies—Farbenfabriken Bayer and Badische Anilin-und Soda-Fabrik—act as a source of inspiration to the rest of the German chemical industry. Hoechst's superhuman efforts to achieve greater efficiency, together with a strong emphasis on research and development, led to their achievement of a 22% increase in turnover last year, and alone of German chemical producers so far, Hoechst have ventured to forecast a 'satisfactory' dividend distribution for 1961.

Further light is thrown on the German chemical situation by a report compiled by the U.S. Government's Bureau of Foreign Commerce, in Washington, which points to a continuing growth within the industry despite a probable slowing of expansion during the current year. Industrial organic chemicals, output of which was increased by nearly 20% last year, are expected to continue to grow at a rapid pace, while industrial inorganics will also continue to grow, but more slowly than in 1960. Consumer chemicals are likely to lag behind industrial chemicals, continuing last year's moderate growth.

The export picture is by no means clear, but the present tough competition faced by the German manufacturers at present (particularly from the U.K.) does not seem likely to get noticeably worse over the next year, since the U.K.'s overtures towards the Common Market are likely to put the brakes on tariff cuts scheduled within the E.F.T.A. area, which would

(Continued on page 358)



## CHANGES IN LICENSING CONTROL FOR EXPORTS TO SOVIET BLOC

THE Board of Trade announce certain changes in export licensing control to come into force on 12 September. The changes are consequential on amendments incorporated in a consolidated list of goods subject to embargo for the Soviet bloc and China which was published in the Board of Trade Journal on 11 August. Some features of these amendments were summarised in *CHEMICAL AGE*, 19 August, page 260.

The main changes in export licensing control are:

(a) Export control is removed from refractory goods, monochlorodifluoromethane and specified zirconium oxide, irrespective of the destination for which they are intended, and from specified vacuum induction furnaces if they are destined for the Commonwealth, the Irish Republic or the U.S.

(b) Control is imposed on the export of tritium and certain tritium compounds, specified manufactures of beryllium, specified calcium, hafnium metal and alloys and compounds to all destinations, and on the export

of specified components of electronic computers and on specialised parts of specified vacuum induction furnaces to countries other than Commonwealth countries, the Irish Republic and the U.S. Control on the export of specified zirconium compounds is extended to exports to the Commonwealth, the Irish Republic and the U.S.

(c) The descriptions of goods to which export control applies have been amended in the case of centrifuges, dosimeters, electrolytic cells, heat exchangers, nuclear reactors, control equipment, electronic and precision instruments and apparatus, cathode-ray oscilloscopes, electronic cathode-ray tubes, vacuum tubes and valves, photoelectric cells, nickel powder, ball and roller bearings, and other items.

The Order making these changes and amending the Export of Goods (Control) Order, 1960, is the Export of Goods (Control) Order, 1960, (Amendment No. 3) Order, 1961 (S.I. 1961 No. 1604) and copies are obtainable from H.M.S.O., Kingsway, London W.C.2, and branches, price 6d (by post 8d).

## World Naphthalene Shortage is Easing, Says B.T.P. Chairman

THE world shortage of naphthalene seems to be easing and with the prospect of rather more raw material in the U.K., the refining plant of British Tar Products Ltd. should operate on a more economic footing. This was stated by Mr. F. Woolley-Hart, chairman, in his annual report.

A rather serious fire at the naphthalene plant in July, 1960, caused a setback in production, but by the end of the financial year (31 March) much of the necessary restoration work had been completed.

The company's hydrogenation plant has been extended, enlarging the range

of high-grade products. Readiness to undertake special distillation work has enlarged B.T.P.'s operations in this field and the necessary extensions to plant will always be undertaken to cope with additional business.

Bulk storage throughput increased 20% over the previous year, but, as with the production side, did not advance during the latter part of the year as quickly as the company would have wished. As regards the future, B.T.P. see no reason to deviate from their planned programme and in due course will proceed with such extensions and alterations as seem desirable. (See also 'Commercial News'.)

## B.o.T. Index of Chemicals Production

AFTER a first-quarter 1961 index of 153 for the chemicals and allied industries, the Board of Trade Index of industrial production shows a figure of 150 for April and May; this compares with a 1960 average of 145 and a 1959 figure of 131. The index is based on a 1954 average of 100.

First quarter index for coke ovens, oil refineries, etc., was 147, followed by 148 in April, 142 in May and 148 in June, the latter figure being provisional. Average for 1960 was 139 and for 1959, 127.

First quarter index for general chemicals, etc., was 151, 154, followed by 151 in each of April and May. The 1960 average index was 146, with 132 in 1959.

## West German Slow-down

(Continued from page 357)

have hit German producers.

Turning to long-term prospects, the U.S. report quotes estimates of 100% production gains for non-cellulosic fibres over the next ten years and 150% gains for resins and plastics, which would result in an overall increase of 225% for organic and 40% for inorganic chemicals. There appears to be no reason, especially with the further development of European free trade, why these increases should not be achieved or even surpassed.

## D.S.M. Plan Overseas Plants and Joint Ventures

IF Staatsmijnen want to maintain the position they have attained it is necessary that the concern should be able to keep up with the current fast development in the chemical sector. This means that to an increasing degree, co-operation must be sought with other important concerns in this field, either by exchange of know-how or by participation in joint production projects to be set up in the Netherlands or elsewhere.

It is possible that Staatsmijnen may have to set up their own production branches outside Limburg, their present headquarters—in the Botlek area of Rotterdam, for example, as well as outside Holland.

This was stated in The Hague on 1 September by Dr. J. W. de Pous, Dutch Netherlands Minister for Economic Affairs. He was officially installing the so-called Staatsmijnen Legal-form Committee, whose job it will be to study the possibility of the State undertaking's becoming an incorporated organisation. The company, a nationalised concern since 1901, is Holland's centralised coal mining concern and one of the country's main chemical producers.

## Five Belgian Chemical Firms to Merge

A NEW line-up of Belgian chemical producers which would concentrate more than half the country's chemical output into a single group, is planned. This would mean an amalgamation of five leading producers, on the lines that led to the formation of Imperial Chemical Industries Ltd. in the 1920's.

The companies contemplating this large-scale programme of integration are: Union Chimique Belge (U.C.B.), Soc. Generale de la Viscose, Soc. Industrielle de la Cellulose (Sidac), Le Fabrique de Soie Artificielle d'Obourg and Fabrique de Soie Artificielle de Fubize.

An announcement was expected in Brussels on Wednesday this week as *CHEMICAL AGE* went to press.

## David Brown Extend Pump Range

Special pump units for chemical plant in oil refineries will be produced by the David Brown Foundries Division, Penistone, near Sheffield, where space allocation for pump manufacture is currently being doubled.

Manufacture of double volute centrifugal pumps at Sheffield was initiated in mid-1960 under an agreement with the Bingham Pump Co., Portland, Oregon, U.S. In the early stages of the project, only horizontal single-stage types were produced but already the scope has been widened to include vertical multi-stage units. In the first instance, these units were produced for the Esso's Fawley refinery (see also page 362).

## Project News

## C.J.B. WIN DISTILLATION PLANT ORDER FROM POLAND

TWO vacuum distillation columns, incorporating Kittel plates, are to be designed and supplied to Poland by **Constructors John Brown Ltd.** under a contract, worth nearly £60,000, received from **Polimpex**, the Polish Government trade organisation. This equipment, a speciality of C.J.B., is to be used in a plant for the production of synthetic fibres which is to be built in Poland.

This is the first time that distillation equipment of this type has been sold to any of the Soviet-bloc countries, and the only Communist country to have ordered such equipment hitherto is Yugoslavia, to whom C.J.B. have sold Kittel plate equipment for special purposes. C.J.B. anticipate that the Polish order will mark the beginning of further business in distillation equipment with the Soviet bloc.

The new contract follows the award to C.J.B., also by Polimpex, of contracts for the design and supply of three tonnage oxygen and nitrogen plants for the Tarnów chemical complex in the south of Poland, reported in *CHEMICAL AGE*, 12 August, page 222.

No details are given of the location of the Polish synthetic fibre plant in which the distillation equipment is to be used, or of the type of fibre to be manufactured. It will be recalled that I.C.I. have sold synthetic fibre know-how to Poland and one Polish project is for the production of a polyester fibre under the name of Elana, based on a licence for Terylene purchased from I.C.I., at Blachownia (C.A., 25 February, p. 323).

### Braun to Handle Design of TiO<sub>2</sub> Plant

THE titanium dioxide plant to be located near Mojave, Calif., and which as stated in *CHEMICAL AGE*, 26 November, 1960, will use process information and know-how from **Laporte Titanium Ltd.** will have as engineering designers, C. F. Braun and Co. The contract has been awarded by American Potash and Chemical Corporation.

### Silicone Production Trials at I.C.I.'s Ardeer Extension

SILICONES production is now in progress on the extension to the Ardeer silicones plant of I.C.I. Nobel Division, which will double the capacity of the plant. Commissioning trials are being carried out and it is reported that the plant is running close to designed rates. It is hoped to complete the trials within the next few weeks. An American engineer—Mr. G. Choy from General Electric Co.'s silicones establishment at Waterford, U.S.—has spent a fortnight at Ardeer in the capacity of consultant,

and has taken part in discussions which have led to "a useful exchange of information."

The reactor stage of the plant—the first important phase of the extension—was completed earlier this year, as reported in *CHEMICAL AGE*, 18 March 1961, p. 447.

Midland Silicones Ltd., the other major U.K. producer of silicones, brought into operation the first new units in their £1 million expansion at Barry, Glamorgan, in April this year (C.A., 15 April, p. 615).

### New Hopton Plant for Magnesium Elektron

A 5,000 tons/year plant at Hopton, Derbyshire, is planned by **Magnesium Elektron Ltd.**, now completely owned by British Aluminium, following their purchase of the 40% interest held by the Distillers Company. The new plant will extract magnesium of 99.9% purity from local dolomite by a thermal process, replacing the firm's original electrolytic plant.

The thermal process is currently being operated successfully by Dominion Magnesium of Canada. The new plant will make the U.K. largely independent of imports of magnesium. Magnesium Elektron are the only U.K. magnesium metal producers and their processes are licensed in many countries of the world, including the U.S.

### Mammoth Foundations for Coleshill Lurgi Project

STEADY progress is reported in work on the new Lurgi high-pressure coal gasification plant being built for the **West Midlands Gas Board** at Coleshill, Birmingham. With site preparation,

drainage, and the construction of road and rail facilities well in hand, the focal point has been the laying of reinforced concrete foundations for the gasifier house which will accommodate the five Lurgi generators.

Some 132 tons of reinforcement were used and the actual pouring of the 746 cu. yd. of concrete was carried out by crane and skip in one continuous operation in 24 hr. A suspended floor slab will be placed over the foundations after the erection of the 25-ton Portal frames carrying the main structure.

When completed the Coleshill plant will have an initial production capacity of 40 million cu. ft./day of gas. Main contractors for the Lurgi and ancillary plants are the **Woodall-Duckham Construction Co. Ltd.**, London.

### Humglas Get S.G.B. Gas Reforming Contract

CONTRACT worth £300,000 for the design and installation of refinery gas reforming plant at Granton, Edinburgh, has been placed by the **Scottish Gas Board** with **Humphreys and Glasgow Ltd.**, London. Of the Onia-Gegi self-steaming type, which produces sufficient waste heat steam for process use, the plant will comprise two units reforming refinery gas (from Grangemouth) to produce a maximum output of 18 million cu. ft./day of 450 B.Th.U. town gas. The plant will also be capable of reforming butane if required.

The plant, which features a single reactor vessel which could be modified in future for light distillate reforming, will be the first of the Onia-Gegi type to be built in Scotland. Design work has already begun and it is expected that the contract—which includes civil engineering as well as design, supply and erection—will be completed in just over a year's time.

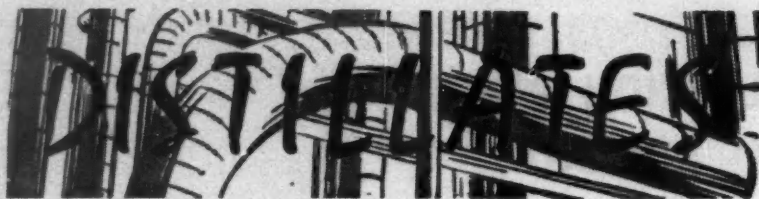
The Onia-Gegi cyclic process was originally developed in France by L'Office National Industriel de l'Azote (O.N.I.A.), and further developed by the Humphreys and Glasgow associate company, Société de Construction d'Appareils pour Gaz à l'Eau et Gaz Industriels (G.E.G.I.).

### Fractionator Column for Shell at Stanlow



Whessoe Limited have recently delivered this 115 ft. high large-diameter high vacuum fractionating column, weighing over 60 tons, to Shell's refinery at Stanlow. The column will be part of the new paraffin and microcrystalline wax plant which is now under construction at the refinery by Stone and Webster Engineering Limited





★ NEWS that the Dutch State Mines (Staatsmijnen) might set up plants in other areas of Holland outside their present base—Limburg—as well as overseas and might also enter into joint ventures with other chemical producers, was given in The Hague last week (see p. 367). This far-reaching development plan would make D.S.M. not only one of Holland's major chemical producers, but also of prime importance in the world.

Such a programme is vital if D.S.M. are to maintain their present chemical position. Announcement of it follows rumours that have been current for some time that the chemical interests of this nationalised coal-mining concern were to be hived-off. A report to this effect in C.A. earlier this year was vigorously denied by D.S.M. (C.A., 17 June, p. 992).

However, I am interested to note that at the end of last week the newly formed Staatsmijnen Legal-form Committee has been given the task of studying the possibility of converting the State concern into a limited company. As stated in our 17 June issue, D.S.M. would hold the capital.

★ ANTI-FREEZE makers are expecting even higher sales in the coming winter. Last year the U.K. market took an estimated 15,000 tons. In the U.S. two large motor groups have already decided to switch from regular glycol anti-freeze to long-life engine coolants. I was interested to see in a recent issue of *Chemical and Engineering News*, our U.S. contemporary, that all 1962 models of American motors will use Dowgard Full-Fill coolant, to be installed during assembly.

The 1962 models of Ford will use an engine coolant guaranteed for two years or 30,000 miles. For the new baby Renault, it is claimed that the engine coolant and anti-freeze mixture need only be topped up at 3,000 mile oil changes, or for the life of the rubber hose.

★ The past week has also brought news of other developments in the field of automotive chemicals. Intensive research in metal organic chemistry has led to the development of at least one new anti-knock compound which might, according to Dr. A. B. Callear, demonstrator in physical chemistry at Cambridge University, be of some commercial value.

This seems to be the first case of anti-knock action by a manganese compound. Such compounds were not previously

known which would be soluble in petrol and sufficiently volatile to vaporise with the fuel. The manganese compound, in combination with lead, could become important in the near future.

Dr. Callear, speaking at the B.A. Chemistry Section meeting on the contribution to anti-knock research made by spectroscopy, said that it was only quite recently that any progress had been made in understanding the cause of 'knock' and the mechanism of anti-knock.

★ THERE seems to be some disagreement on the part of leading atomists as to the temperature needed for the successful controlled release of thermonuclear energy. Sir William Penney, deputy chairman of the U.K. Atomic Energy Authority, has put this at about 100 million degrees, while a leading U.S. researcher has given a figure of 50 million degrees.

From the Technical High School in Stockholm comes news that the Swedish thermonuclear project has attained temperatures of between two and three million degrees. Interesting part of this work, however, has been the ability to hold highly ionised gas, known as plasma, stable for as long as seven-thousandths of a second.

The method used is that pioneered at Harwell with the first Zeta machine, namely, passing rotating plasma at high speed by centrifugal force in a toroidal magnetic field. It is felt that the problems of confining the hot gas and of instability of the magnetic field are both near solution and that with new apparatus it would be possible to hold the plasma stable for much longer. The Swedish work represents a major advance—but a real breakthrough in curing instability would greatly speed the time when controlled thermonuclear power is translated from the realm of pure science to commercial application.

★ SEARCH the chemical engineering literature as you may, you are unlikely to find any references to the subject of scaring birds. Articles you will find a-plenty on process economics, design team organisation, thermodynamic phenomena and suchlike trivial subjects, but never a whisper on the vital topic of birds.

To the operators of Humble Oil and Refining Co.'s huge refinery at Baton Rouge, Louisiana, this lack of guidance on birds represents a serious gap in the literature. Not that these operators have any particular grudge against birds;

indeed, some of them actually like birds. But even an operator who is positively crazy about birds finds his enthusiasm wearing a little thin when he encounters, every day, thousands of purple martins perched all over his plant—on columns, handrails, girders, cross braces and any other accessible piece of steelwork.

The trouble is that the large spring-time population of purple martins at Baton Rouge, La., are intensely interested in refinery operations. They held a course of evening classes on top of a large gas holder every spring, and when this was pulled down a year or two ago, they upgraded themselves to the refinery's new Hydroformer. Scandalised at the idea of their nice shiny Hydroformer being messed by a flock of birds, the operators acquired an owl and placed it on guard there, and later found another way of scaring the birds by playing a record of martin distress calls.

Finding that the Hydroformer was a little advanced for them, the birds now content themselves with the pipe stills, where there is unlimited perching accommodation. Result: Humble operators have still 'got the bird'.

The gap in the literature remains—except for my mention in the issue of 27 May, 1961, p. 848, of a method of deterring birds from roosting on ledges, etc., by fixing a strip of material that is uncomfortably wobbly to perch on. Anyway, perhaps plant designers will take note of the bird problem and will allow for it in future plants—for instance, by incorporating some real 'catwalks'?

★ ALTHOUGH the number of British exhibitors at the Leipzig Autumn Fair has increased from 20 to 23 over last year, I.C.I. are the only major U.K. company represented. They are convinced that the East German market is worth cultivating and have decided to take a five year lease on their stand at the Fair. They are concentrating on dyestuffs; at the Spring Fair this year they were able to sell £150,000 worth.

Some West German firms have thought that it would not be right to put in an appearance at the Fair after the Berlin crisis, but I.C.I. have stressed that their policy is that trade had nothing to do with politics or the Berlin crisis.

★ I WAS rather surprised to read in the August issue of *Chemische Industrie*, the monthly West German journal that "I.C.I. were able to claim about 25% of the U.K. chemicals turnover in 1960." I.C.I. have never publicly stated the proportion of the British chemical industry that is represented by their many divisions, but in the industry this is widely put at around one-third.

*Alembic*



## Sale of Dispersed Pigments to Cabot Will Mean Speed-up of Acheson's Plans to Diversify

THE business and manufacturing facilities of the Dispersed Pigments Division of Acheson Industries (Europe) Ltd. at Dukinfield, Cheshire, are to be acquired by Cabot Carbon Ltd., of Stanlow, Ellesmere Port, Cheshire. Agreement to this effect was signed on 18 August and the transaction will probably be completed during October.

Following this agreement, Acheson is to speed up their expansion and diversification programme. Mr. E. G.



E. G. Clarke, managing director of Acheson Industries (Europe), left, and G. H. Cash, Cabot's managing director

Clarke, managing director of Acheson Industries (Europe) Ltd., last week said that future policy would embrace the setting up of new companies or the acquisition of existing companies whose activities are allied to or compatible with the Acheson product range.

Mr. George H. Cash, managing director of Cabot Carbon, says that the acquisition will enable the company to pursue the commercial development of their crosslinkable polythene compounds which are marketed under the name Cab-XL. Also the Cabot organisation's knowledge of pigments—as the world's largest producer and distributor of carbon black—will make an important contribution to strengthening Acheson Dispersed Pigment's position in the carbon black-thermoplastic resin dispersion field.

The present transaction is part of a larger agreement under which Cabot Corporation of Boston, Mass., acquire Acheson Dispersed Pigments Co., Philadelphia, and their subsidiaries and affiliates in Orange, Tex., and Xenia, Ohio. The agreement only relates to the dispersed pigments operations of the Acheson organisation and in no way affects those units in the U.S. and Europe engaged in the production of dispersions of colloidal graphite and other solids.

The colloidal dispersion manufacturing side of Acheson's is the original, basic and most important part of their business and one in which they have been engaged for more than 50 years. Their position as leading manufacturers of colloidal dispersions will not therefore be affected by the agreement. Colloids

plants at Plymouth, Devon; Scheemda (Gr.), the Netherlands; and Port Huron, Mich., will continue under Acheson ownership.

Mr. Clarke stated that Acheson's had anticipated some time ago a change in the structure of the plastics industry and concluded that the function carried out by A.D.P., that of a dispersing service, should logically and more economically be carried out by the raw materials supplier, that is by a production of pigments and/or resins, rather than a raw materials buyer such as A.D.P. Cabot

Carbon, thinking along similar lines, decided about a year ago that there was a real need for them to acquire their own dispersing facilities. Believing the excellently equipped A.D.P. plants to be ideal—these saw the recent completion of a 25,000 sq. ft. extension—Cabot approached Acheson's. Cabot intend to operate the Dukinfield plant during the immediate future as their Acheson Dispersed Pigments Division.

Founded in 1882, the Cabot Group have plants in Texas, Louisiana, Canada, England, France, Italy and joint ventures in Holland and Australia; another is under construction in the Argentine. Cabot also operate throughout the world as producers of both natural gas and crude oil, LPG, natural gasoline, oil-well pumping units, portable drilling and earth moving equipment, pine tar, charcoal and colloidal silica.

## Catalytic Oxidation of Hydrocarbons

ONE of the most important tasks of the chemical and oil industries of the Soviet Union is to increase markedly the use of natural oil gases and oil products for the production of synthetic rubber, alcohol, detergents and other chemical products, and to widen the variety and to increase the production of synthetic resins, high quality lacquers and dyes, plastics, etc. This was a decision of a plenary session of the Central Committee of the Communist Party in 1959.

In a paper published in *Uspekhi Khimii* 28, 5, 1959, the translation of which is available from the Library, Atomic Energy Research Establishment, Harwell, Berks. (AERE-TRANS 860), the author, L. Ya Margolis, states that the difficulties in the industrial realisation of oxidation processes is very great. There is no doubt that the number and scale of industrial processes based on the direct catalytic oxidation of organic compounds are continually growing. However, until recently, theory did not sufficiently clear directions for the practi-

cal application of catalytic organic synthesis, owing to the complexity of the mechanism. The tremendous practical experience of selecting catalysts for the oxidation of hydrocarbons was scarcely subjected to any theoretical analysis. Without studying the elementary mechanism, says the author, it is impossible to construct a theory for the catalytic oxidation of hydrocarbons.

In this paper, six types of reactions are studied: direct addition; partial oxidation; destructive oxidation; oxidative condensation; oxidative condensation with inorganic substance; and extensive oxidation with complete destruction of the hydrocarbon skeleton.

Sections in the paper deals with catalysts, mechanisms of hydrocarbon oxidation reactions, adsorption of oxygen on oxidation catalysts, adsorption of hydrocarbons on oxidation catalysts, and kinetics of hydrocarbon oxidation. A full list of references and some schemes for various oxidation processes are given.

## Gulton of U.S. Acquire Mervyn Instruments

SECOND U.K. firm in recent months to join Gulton Industries (Great Britain) Ltd., the wholly-owned subsidiary of Gulton Industries Inc., U.S., are Mervyn Instruments, polarography specialists, Woking. The first was West Instrument Ltd., the temperature control specialists.

The board of Mervyn Instruments has been reconstituted and now consists of Mr. J. A. Hartnett, chairman, Mr. A. Peacock, who now becomes managing director from technical director, Mr. A. Newing and Mr. David Barr.

Mervyn Instruments, who are engaged on work which includes analytical process instruments for the chemical industry, etc., are best known for their work in the field of i.r., optical and electron/optical fields. Gulton will send personnel to train Mervyn technicians in developing U.S. techniques.

## Sichel Adhesives Join Brown and Polson

SICHEL Adhesives Ltd., manufacturers of adhesives for industry, have joined the Brown and Polson Group of companies. In a statement on the merger, Mr. F. M. Hagedorn, (chairman and managing director of Sichel Adhesives, says: "By this alliance the knowledge and experience of the two companies are pooled and it is intended still further to improve technical and manufacturing services to our customers while, at the same time, developing export sales. It is realised that, with the likely advent of the Common Market, British industry needs to be thoroughly efficient."

Dr. Walter Dux and Dr. Eric Dux remain as Mr. Hagedorn's partners in this new development with Brown and Polson. Sichel Adhesives will continue to operate from their factory in Richmond, Surrey.

## NEW ENGINEERING USES OF NYLON MAY SPRING FROM U.S. SYNTHESIS ADVANCES

USES of nylon as an engineering material may be extended as a result of recent advances in nylon chemistry, according to research workers of the Battelle Memorial Institute, U.S. For example, it has recently been discovered that nylon can be readily synthesised at room temperature and at a very high rate. The method, called interfacial condensation, involves the reaction of diacid chlorides with diamines, such as adipyl chloride, with diamines at the interface of two immiscible solutions. A film of nylon forms instantly, and can be reformed as fast as the polymer is withdrawn.

Several advantages accrue from this development:

(1) New polymers not previously possible can easily be prepared. For instance, many aromatic ingredients, such as terephthalic acid, cannot be used in melt condensation polymerisations because the growing polymer has a melting point significantly higher than its decomposition temperature. Polymers of this type have not been fully evaluated. However, it would not be unexpected if they had higher heat distortion points than conventional polyamides and, in general, better high-temperature properties. Since they cannot be melted, polymers of this type could be fabricated into complex shapes by sintering.

(2) Greater control can be exercised over the molecular size and distribution in this polymerisation method. Polymers of extremely high molecular weight, not previously possible using melt methods, could be synthesised.

(3) Far greater quantities of polymer can be prepared in the time necessary to prepare nylon by conventional methods. Theoretically, the reaction rates are immeasurably faster and indicate potential production rates as high as several tons per minute.

Recent advances in the kinetics of polymerisation of caprolactam to nylon 6 have also raised some interesting possibilities. Conventionally, this reaction is catalysed with water, or a water-producing nylon salt. Depending upon the desired molecular weight, a polymerisation may take 5-8 hr. at 250°C to complete. It has long been known that alkali metals, such as sodium, are far more effective catalysts than water. Reaction rates are considerably more rapid, and lower temperatures may be used. Polymerisation can also be run in the solid state. This would permit the rapid preparation of polymer in a mould cavity. O. Wichterle has described the successful casting of polycaprolactam into complex objects weighing several hundred pounds by this method. Using the normal fabrication techniques and equipment, these objects could not be produced.

Considerable research is now being devoted to a study of graft copolymers of nylon with other plastics, such as polystyrene or polymethyl methacrylate. Eventually, this technique may lead to an entirely new group of plastics that combine some of nylon's unusual properties with those of unrelated materials. Other advances are to be expected. Some

will stem from improved fabricating techniques; others from an increased awareness of nylon's properties.

The foregoing developments are discussed in the August issue of the *Battelle Technical Review* by M. M. Epstein and B. Bennett, who also summarise the properties and applications of nylon as an engineering material and describe its chemical and molecular structure. They point out that most engineering uses of nylon to date are based on its unusual properties, since it is still a relatively expensive material. They conclude, however, that, assuming a continuation of the price decline of the last few years, nylon may be expected to serve in many new and exciting ways.

## Special Multi-stage Vertical Pumps Handle Ethylene, Hydrocarbons at Fawley

SOME tricky problems had to be overcome by the David Brown Foundries Division, Penistone, near Sheffield in the manufacture of multi-stage pumps of the vertical type, for use in a chemical plant at Esso Petroleum Co.'s Fawley refinery, since David Brown's had previously produced only horizontal single-stage types (see also page 358). The units for Fawley, for which orders were placed with David Brown by Foster Wheeler Ltd., consisted basically of a vertically-split inner casing which is contained in a stainless steel barrel, rotary elements being easily accessible. All the materials needed to be specially constituted to withstand the abnormal working conditions to which they would be subjected. The radial balance which is a feature of the David Brown Bingham double volute design is retained. Moreover, discharge pressure completely surrounds the inner case and inter-stage leakage is thus avoided.

Eight-stage vertical pumps have been supplied for the second chemical plant at Fawley for pumping liquid ethylene at a temperature of -152°F from storage spheres to the customer. These pumps have a capacity of 70 g.p.m. at 2,100 ft. head; this can be extended to 140 g.p.m. at a head of approximately 1,250 ft. Operating speed is 5,800 r.p.m. with drive from a directly-coupled vertical steam turbine.

Particularly intricate problems were presented at the stages of pattern-making

and moulding stages of production of 16-stage pumps, the inner casing of which is 7 ft. long. Required in connection with the Jules Thompson liquid recovery process in the same section of the Fawley plant, these units will handle liquid hydrocarbon at a temperature of -130°F. Each pump will be driven at 3,000 r.p.m. by a 15 h.p. vertical induction motor and will handle 20 g.p.m. against a differential head of 1,325 ft.

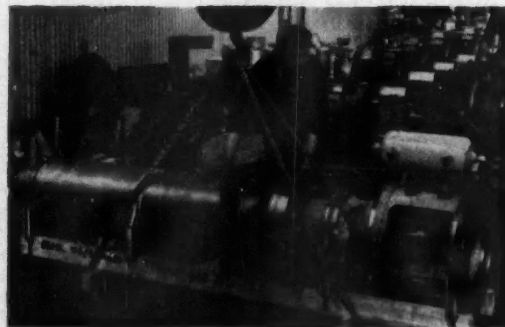
## Leeds Fatality at Yorkshire Tar Distillers

While working near a chemical plant at the works of the Yorkshire Tar Distillers Ltd., Stourton, Leeds, on 30 August, James Dunwell, a 40-year-old process worker was sprayed on the face and chest with carbolic acid. He was dead on arrival at St. James's Hospital, Leeds. According to a spokesman for the company, very little acid was involved.

## Mid-year Synthetic Rubber Output

Production of synthetic rubber for June declined 7,500 to 147,500 long tons on the revised May figures, states the Secretariat of the International Rubber Study Group in a preliminary report. Consumption gained an additional 5,000 to 160,000 long tons. Stocks at the end of the period were down 10,000 at 355,000 long tons.

A 17-stage double volute centrifugal pump ready for despatch from the David Brown Foundries Division to the Fawley refinery. Units behind are standard David Brown Bingham horizontal process pumps





# INTERNATIONAL PACKAGING EXHIBITION

## Plastics Packages for Chemicals Well to the Fore

**P**REDOMINANCE of plastics in modern packaging is well illustrated at the International Packaging Exhibition, which is being held at Olympia, London, 5-15 September. The exhibition is organised by Provincial Exhibitions Ltd. and F. W. Bridges and Sons Ltd. in collaboration with the Institute of Packaging.

*Polythene* is particularly evident, whether as rigid or semi-rigid containers for bulk chemicals, as liners for drums and sacks, or as film for use in retail packs of various kinds. On the stand of **Telcon Plastics Ltd.**, Green Street Green, Orpington, Kent—a member of the B.I.C.C. Group—special prominence is given to the introduction of polythene coatings down to 0.0003 in. thickness, offering new economies in using ultrathin coatings especially when applied to inexpensive papers. Applications of Telcothene-coated and laminated materials are also being demonstrated on this stand; these applications include multi-wall sacks with a polythene coated innermost wall, for the packaging of fertilisers and powdered chemicals; drums and other containers made from coated boards; and a range of bags, sachets and other small containers made from light coated papers for the packaging of foodstuffs, chemicals, etc.

**Dixopak**, a new type of polythene film with clarity characteristics comparable with those of high quality viscose film, is shown for the first time by **Peter Dixon and Son Ltd.**, 11 New Fetter Lane, London E.C.4. The extra sparkle is produced in manufacture by cooling the film over a chilled metal roll instead of by a blast of air. Dixopak is made in thicknesses of 0.001-0.005 in.

Polythene linings feature in a new series of drums, with capacities of 5, 10 and 12 gall., now being produced by **E. A. Brough and Co. Ltd.**, Upper Parliament Street, Liverpool 8. The 5-gall. model has a fixed top and square sides, making for economy of storage space, and can be supplied with a vented cap if materials likely to build up internal pressure have to be accommodated. The 10 and 12-gall. models are cylindrical and have an open-ended steel shell.

**Todd Bros. (St. Helens and Widnes) Ltd.**, of Widnes, offer the Policrate 10-gall. polythene drum for storing liquids and slurries, supplied in a wire crate for easy handling. On the same stand is the I.C. Polprotek—a steel drum with polythene bottle inside. It incorporates a detachable polythene spout and is specially shaped for safe stacking. The same firm offer the 25-gall. Alka drum, which is in mild steel with a polythene inner container and plastics coated steel lid.

Formation of Reed Plastic Packaging

Ltd. at the end of last year marked the entry of the **Reed Paper Group**, Kew Bridge, Brentford, Middlesex, into the plastics packaging field. At present, manufacture is confined to a range of thin-wall, blow-moulded polythene containers for liquid, paste and powdered chemicals. They range in capacity from 5-45 gall. and come in both open and closed top varieties, being designed for use with steel drums, fibreboard cases and drums and wire hampers. Screw caps, also of polythene, go with the closed top types, and closures available include a venting device that allows excess gas to escape while retaining the liquid.

A new method of controlling the thickness of the walls of plastics bottles and containers has now been developed by the **Ward Adams Co. Ltd.**, Powder Mills, Leigh, Nr. Tonbridge, Kent. This has an important application for large containers, of 10 gall. and above, where a strong base is essential for holding the load and resisting wear. With standard moulding techniques it is frequently the base which is the weakest part, the company points out, but with the new process an overall consistency of material can be maintained. The firm also show their Waco 10-gall. drum, in which a semi-rigid polythene container is surrounded by a close fitting steel outer. A new feature to be exhibited for the first time will be containers where the employment of the new technique has enabled outer protection of the bottle to be dispensed with.

Polythene caps for glass, metal or plastics containers of 5-40 mm. internal neck diameters are being manufactured under licence from two German companies by the **Flexile Metal Co. Ltd.**, Bessemer Drive, Stevenage, Herts. The caps are held firmly in position by flexible fins which are slightly larger than the neck interiors and mould themselves into them. Various tablet holding devices

can be added to the cap for securing single-line and random-packed contents in place by exerting downward pressure.

*Polypropylene*. As well as various types of acetate film and sheet, **British Celanese Ltd.**, of Hanover Square, London W.1, are showing Propylex polypropylene sheet, for the packaging of chemicals, corrosive liquids, food, etc., and for the manufacture of sterilisable surgical packs. Polypropylene film features among a number of new packaging projects featured on the stand of **British Visqueen Ltd.**, Six Hills Way, Stevenage, Herts., where there is also a demonstration of the Melton-Mould machine involving a new polythene packaging technique for the 'plunge-packaging' of products of irregular shape.

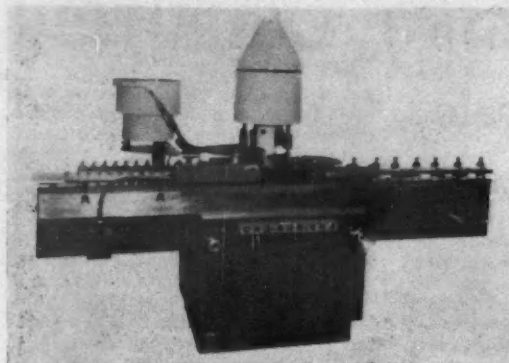
*P.v.c.* also features in a number of new packaging techniques on show, one being the container demonstrated on the stand of **Planapack Ltd.**, Albert Drive, Sheerwater, Woking, Surrey. Main feature of the container, which is manufactured from layflat p.v.c. tube, is the design of the screw-on valve cap, through which the container is filled. A plug, which is moulded as an integral part of the cap, is attached to the cap by a thin membrane and four apertures are spaced round the plug, through which the product to be packaged passes. The product (liquids, shampoos, cosmetics, shoe creams, wax polishes etc.) is forced into the container by a special filling machine. At the completion of the metered shot, the plug is forced under impact into the cap, breaking the membrane to which it is attached, and so sealing the container.

*Metal Drums and Containers* are also well in evidence at the exhibition, showing that, despite the advent of plastics and fibreboard containers, metals still hold their place. Versatility of metal for drums, kegs, etc., is well illustrated on the stand of **Metal Containers Ltd.**, 17 Waterloo Place, Pall Mall, London S.W.1. The company's range includes steel drums for liquids, open top containers for powders, semi-solids and solids, and a variety of American pails, ring closures, kegs and taper drums. Galvanised and tinned drums, heavy-duty

Organic coatings and special lacquers for protecting drum and can interiors are displayed by **Robert Ingham, Clark and Co.** Photo illustrates a chemical test of protective container linings







**Dicomulti high-speed capping and sealing machine shown by Designs and Installations Ltd.**

rolling hoop drums, and internally coated steel drums are also shown.

A new range of drums with tinplate ends are being manufactured by the **Metal Box Co. Ltd.**, 37 Baker Street, London W.1, for packing foodstuffs or chemicals in paste or powder form. Body of the drum, with diameter of 8 in. and height between 2 in. and 20 in., is of cartridge paper, kraft or chipboard. The same company's range of Plexicap aluminium tubes with curled tops have a new sealing device consisting of two rings inside the cap which grip the inside and outside of the curl.

**Heston Aircraft and Associated Engineers Ltd.**, of Hounslow, Middlesex, show the Nest-a-Bin, a new aluminium container for the bulk storage or transport of liquid and granular products. The bin consists of two circular halves held together by a central ring. For handling granular products a conically shaped top half is available with a discharge aperture of 22½ in., the cone angle being 70°. With three standard size "halves" seven complete units with capacities from 220-660 gall. and 54-70 cu. ft. can be assembled.

**Machinery.** A compact new machine for filling powders to a high degree of accuracy and dispensing them into containers, is exhibited for the first time by **Southall and Smith Ltd.**, Villa Street Works, Hockley, Birmingham. As it can maintain an operation speed of between 60 and 65 fillings/min., it is specially adapted for use with automatic packaging machinery. Special features include a device for instantaneous adjustment of weight, and a quick release appliance which enables the feed mechanism to be changed so that different types of product can be handled.

Two new high-speed packaging



**Chemicals or foodstuffs in paste or powder form can be packed in this new Metal Box range of drums with tinplate ends**

machines are shown by **Designs and Installations Ltd.**, Walnut Tree Close, Guildford, Surrey. The first is the Dicomulti, a screw capper for bottle sizes up to 4½ in. and 13 in. high, which applies either metal or plastic caps at a maximum speed of 240 bottles/min. The second is the Dico seal, which is used for applying rubber sealing discs and aluminium caps to vials up to 2½ in. dia. and 5 in. high, at a maximum speed of 400/min.

The Rotapress, a new double rotary machine for compressing tablets at high speed, has been developed by **Manesty Machines Ltd.**, Evans Road, Speke, Liverpool 24. Four models are available, ranging from 29-55 stations, with outputs of 696-5,280 tablets/min. Features of the machine are new hydraulic pressure loading, internal helical gear drive, vari-

able speed, new rotary feeding device, dust extraction points, and automatic lubrication.

A new automatic machine for the high-speed packaging of tablets with diameters of 0.2-0.8 in. into containers with diameters of 0.8-2.5 in. and heights between 1 in. and 5 in., will be exhibited by **C. E. King and Sons Ltd.**, Leacroft, Staines, Middlesex. Containers made of plastic, glass or aluminium are fed from an unscrambling table to a Vee link conveyor. The conveyor carries the container through all the machine's operations, thus eliminating the problem of transferring from one machine to another. The second operation is batch-marking the container, and the third operation is compressed air cleaning.

**Mather and Platt Ltd.**, of Radcliffe, Manchester, are now manufacturing under licence the Standard-Knapp Model 806 carton packer, an American packer which they are exhibiting for the first time in the U.K. It loads cartons or bags into outer cases at speeds up to 16 cases/min. The empty case is placed over the end of a funnel to which a conveyor delivers the cartons. They are then arranged in rows and, when assembled into the correct pattern for a load, a lift-table transfers the rows up through gates in the funnel. As each row is pushed upwards the gates close to secure it in position. When the whole load is assembled a pusher mechanism thrusts it bodily into the case, after which the filled case is lowered automatically to a discharge conveyor. The machine is pneumatically operated.

## Vacuum-forming of Polypropylene

**BOTH** the engineering and the materials side of the plastics industry has been concerned for some time with the problem of exploiting the merits of polypropylene for vacuum-forming. One of the difficulties is the production of a truly homogeneous sheet of polypropylene as a starting material but the greatest problem is one of economy. To make it an economical process, it is necessary to achieve a cycle time comparable with that of a material with a greater thermal conductivity and a lower softening point.

**Telcon Plastics Ltd.**, Green Street Green, Orpington, Kent, a member of the British Insulated Callender's Cables Ltd., have for some months been carrying out development work with polypropylene, and have succeeded in producing a high quality polypropylene sheet by controlled extrusion.

Makers of vacuum forming machinery have been working on the design and production of equipment capable of providing a heating density sufficient for the needs of polypropylene and other plastics of high softening point. Parnall & Sons Ltd., of Bristol, have been extremely active in this direction.

The two converging lines of investigation met most opportunely at the International Plastics Exhibition at

Olympia this year, when Parnall were able to demonstrate on their stand the production of complex formings, having a 1:1 draw ratio, from sheet ¼ in. thick, in an overall time-cycle of 1 minute 50 seconds. The machine used was the Parnavac 2721 H.D., the smallest of their range of sandwich heating machines with upper and lower heaters being rated at 9 kW and 3 kW respectively.

The formings, which were made from Telcon polypropylene sheet, of ¼ in. and also of 1/10 in. gauge, were of good uniformity, both in thickness and mechanical strength, and it is claimed their surface finish was far better than any hitherto seen in polypropylene formings.

The Parnall machines are available in sizes up to 72 x 48 in., and Telcon Plastics Ltd. produce sheeting, in polypropylene and other thermoplastics, including polystyrene, p.v.c., polythene and A.B.S. resins, in widths up to 54 in. and gauges ranging from 0.020 in. to ¼ in.

### D.C.L. Cut Rigidex Price

Distillers Plastics Group announce reductions in the prices of Rigidex high density polyethylene of up to 4d/lb. according to grade (e.g. filament grades by 1½d/lb., bottle grades by 3d/lb. and injection moulding grades by 4d/lb.).

# BRITISH ASSOCIATION ANNUAL MEETING



Left to right: Dr. I. J. Faulkner (hon. recorder of Section B (works manager, I.C.I. Billingham Division), Professor R. W. G. Norrish, F.R.S., president of Section B (Professor of Physical Chemistry, University of Cambridge), Mrs. Norrish, E. W. Schwehr, a vice-president of Section B (chief chemist, Fisons Fertilizers Ltd., W. E. Palmer, G. E. Macdonnel (control chemist, Arthur Guinness), P. W. B. Semmens (Process Investigations Dept., I.C.I. Billingham)

## Spectroscopy Chosen as Chemistry Section's Subject

THE importance of the part played by the British Association in the evolution of science during the last 100 years was emphasised by Professor R. G. W. Norrish, F.R.S., president of Section B (Chemistry), speaking at the section dinner held at the Royal Hotel, Norwich, on 1 September.

Two words may be applied to the British Association, according to Professor Norrish—tradition and evolution. The B.A. combined the old and the new in the most graceful fashion. Earlier men were able to understand the roots of all groups of science, but now we are learning more and more about less and less, so that an organisation such as the British Association is very valuable in the opportunity it provides for scientists to meet those of other persuasions.

The choice of spectroscopy as the subject of Section B discussions is fitting in this year which marks the centenary of the spectroscope. The spectroscope, said the professor, is by far the most important instrument science has ever invented. Its vision extends from atoms and molecules to the expanding universe. Its applications extend over the whole of chemistry, and science could be nowhere near where it is without it, the professor maintained.

The toast of the Section was proposed by Lord Fleck who said that it was to be congratulated on its choice of subject. The toast of the guests was proposed by Dr. E. C. Wood, Public Analyst of Norwich, and a vice-president of the Section.

The guests were Sir William Slater, K.B.E., F.R.S., president of Section M (Agriculture), and recently elected president of the Royal Institute of Chemistry,

Sir John Russell, F.R.S., president of the British Association in 1949, and Lady Russell. Sir William Slater replied on behalf of the guests.

Factors to be considered when selecting a spectrometer for a particular purpose were discussed by R. A. C. Isbell (Hilger and Watts Ltd.) in a paper delivered to Section B of the British Association on 1 September, entitled 'Analytical and industrial applications of spectroscopy'. The factors are as follows: the number of samples and elements to be determined; the speed factor—is it vital to have the answer in two or three minutes or would 30 minutes or several hours suffice?; which method gives adequate sensitivity on the maximum of elements in the usual type of samples?; does the physical nature of the samples introduce diffi-



Sir William Slater, K.B.E., F.R.S. (left), talking to Professor Norrish at the B.A. Chemistry Section dinner

culties in some methods?; other circumstances being equal, would one technique provide a facility for handling the odd and not so routine specimen? Price of equipment was placed last by Mr. Isbell because in many cases, particularly in industry, the saving in time is so great that it completely outweighs the difference of price of the various instruments.

In his paper, Mr. Isbell outlined the uses of the various types of spectrometers in various industries. In the field of drugs and medicine, spectroscopic instruments, particularly absorption spectrophotometers, are invaluable tools.

One also wonders whether the development of special alloys of titanium and zirconium would have been possible without spectroscopic instruments.

## More Oil Products Used in U.K.

CHEMICAL feedstock consumption in the U.K. over the first half of 1961 reached a total of 795,227 tons—a 4% increase over the 764,939 tons delivered during the first half of 1960—according to the Petroleum Information Bureau. Other oil refinery products to show increased deliveries include light distillate feedstock, from 189,362 to 252,411 tons; propane and butane (increased 37% to 99,302 tons); and refinery gases, from 118,927 to 131,633 tons. Deliveries of industrial benzole and other industrial spirits showed a decline from 114,242 to 107,759 tons.

Total consumption of oil products in the U.K. reached some 23.2 million tons, 9.2% more than in the comparable period of 1960.

## Government Scientists' Token Strike

Scientific assistants of the Civil Service are to stage a one-day token strike and demonstration on 22 September to register their protest against the delay in their four-year-old pay negotiations (see Distillates, last week). It is not yet decided what form the demonstration will take but it is expected to be "on the Treasury doorstep".



## Bookshelf

# Monograph is Good Start for Literature Search

PRINCIPLES AND APPLICATIONS OF PAPER ELECTROPHORESIS. By Ch. Wunderly. D. Van Nostrand Company Ltd., London, 1961. Pp. 253. 260s.

This monograph which is a revised version of a German edition presents an up-to-date review of the methods and results of paper electrophoresis. After a three-page introduction on the historical development and the terminology of the subject the author gives a clear and concise account of its theoretical foundations (16 pages), followed by a survey (25 pages) of methods, which is nicely illustrated, then a useful discussion on techniques (36 pages) and a survey of results (94 pages). The book is completed by a list of 1,721 references, three and a half pages of subject index and 25 of author index.

The various sections are sub-divided sensibly and the 10 pages under techniques on reproducibility and spread of errors is particularly valuable. The chapter on results ranges from proteins to inorganic ions. The paper, printing, photographic reproductions and diagrams and tables are excellent.

Many laboratories should find this a useful acquisition which provides a remarkably good starting point for searches of literature for a subject which is scattered in many journals. As the list of references is in the order of use by the author, the alphabetical author index is necessary, but a more extensive subject index would be helpful.

### ► Introductory Chemistry

INTRODUCTORY CHEMISTRY, 2ND EDITION. By O. W. Nitz. Van Nostrand, Princeton, 1961. Pp. viii + 631. 60s.

Few British authors have attempted to write science books suitable for fifth and sixth form students who are not science specialists. There has been little market for them until recently when it has again been accepted that an educated man should know something of Natural Philosophy, though the reasons for this acceptance today are less attractive than those current 100 years ago. In the U.S. the comparable educational level is reached in the first year of college and it is for these students the book is intended.

The book is old-fashioned in approach with a lot of recent discoveries inserted into it. There are many illustrations of industrial plants whose inappropriateness has long been recognised by most authors. The outlook is totally different from that of the texts prepared by the Chemical Education Materials Study which is much more intellectually satis-

fying and which now seems to be gaining ground in the English-speaking world. On the other hand one should not lose sight of the fact that any student who spent a year on this book would be able to take a much more intelligent interest in the world than would a student who had not had any chemical instruction. The author has collected together an immense amount of interesting information and presented it attractively.

### ► Organic Progress

PROGRESS IN ORGANIC CHEMISTRY 5. Edited by J. W. Cook and W. Carruthers. Butterworths, London, 1961. Pp. viii + 172. 50s.

The latest volume in this intermittent series contains five reviews of roughly equal lengths. Homolytic Oxidation Processes by W. A. Waters (it is a rare pleasure nowadays to see a review article written by a Fellow of the Royal Society without a collaborator); Developments in Hydroxylation of Phenols by J. D. Loudon; The Chemistry of Dextran by C. R. Ricketts; The Chemistry of the Higher Terpenoids by J. A. Barltrop and N. A. J. Rogers; Tropylium and Related Compounds by T. Nozoe. The editors are to be congratulated on persuading these authorities to write articles suitable for a wide range of chemists. It is just this sort of article that is needed for 'Quarterly Reviews' which has contained a due proportion of organic articles recently. In general the titles accurately describe the articles though some of them deliberately restrict their coverage to material that has appeared since the last major review. The only surprise is that Homolytic Oxidation is not extended to cover combustion although gas phase reactions of the halogens are discussed.

The book should find a place in all general chemical libraries.

### ► Paraffin Properties

RULES AND METHODS FOR CALCULATING THE PHYSICO-CHEMICAL PROPERTIES OF PARAFFINIC HYDROCARBONS. By V. M. Tatevskii, V. A. Benderskii and S. S. Yarovoi. Pergamon Press, Oxford, 1961. Pp. xii + 128. 30s.

Some people when presented with vast tables of data such as those produced by the projects of the American Petroleum Institute feel impelled to seek empirical relations between them. Tatevskii's curiosity has impelled him over a period of 10 years to devote much

of his time and that of his collaborators to this end. He has produced three methods of calculation of properties that are considered here. He manages to get very good agreement and the relations are useful for predicting the thermodynamic properties of  $C_{18}$  to  $C_{28}$  hydrocarbons. The properties cannot be directly determined because the pure compounds are not available. Despite this utility, one marvels that the author should have published 27 papers on his calculations. This book brings the results of the computations together in a convenient form.

There is evidence of slovenly translation. Out of 54 references, 13 are to Anglo Saxon literature. Five errors in these 13 references were apparent on cursory inspection. As the references were to literature that is readily available there is no excuse for not checking the manuscript properly.

### ► Oxygen in Steel

THE USE OF OXYGEN IN THE ELECTROMETALLURGY OF STEEL. By G. M. Borodulin, translated by G. F. Modlen. Pergamon, London, 1961. Pp. viii + 112. 50s.

No attempt is made by the author of this book to consider the theoretical background of the use of oxygen in the electrometallurgy of steel. His purpose is to describe fully the mode of operation of the furnaces and results achieved at several major Russian steelworks. The details given include time-sheets for different types of melts, analyses of the steel produced and tables of the consumption of materials. The fourth chapter attempts estimates of the economic advantages of the methods. The estimates are set out in great detail but the cost of labour is not specifically considered. Few such detailed records of industrial processes have been published. This volume will be welcomed by the specialist for whom it is intended.

### ► Distillation

INTERNATIONAL SYMPOSIUM ON DISTILLATION. Edited by J. B. Brennan, Institution of Chemical Engineers, London, 1960. Pp. 281. 80s.

This volume consists of 35 papers read at the 24th Meeting of the European Federation of Chemical Engineering, held in England in 1960. These papers on various aspects of the chemical engineering of distillation have been grouped as follows: (1) Heat and Mass Transfer I, (2) Heat and Mass Transfer II, (3) Vapour-liquid Equilibria, (4) Performance of Packed Columns, (5) Performance of Tray and Other Columns I, (6) Performance of Tray and Other Columns II. There is also a name and author index. Each group of papers is followed by a section of the discussion on the papers. Most of the authors of papers presented at this meeting were British, but there were also authors from other European countries, America, and Asia.



## Overseas News

### E.N.I.-INDIA AGREEMENT MAY COVER NAPHTHA CRACKER

**U**NDER its agreement with the Italian Government, E.N.I., the Italian State concern, have been asked to carry out a detailed project study for a 100,000 to 200,000 tons/year naphtha cracker to be located at Barauni refinery. This would enable the production of petrochemicals to be taken up.

Projects so far approved under the E.N.I. credits, which will range between £35 million and £55 million, include pipelines from Barauni refinery to Delhi and Calcutta; gas fractionation plant in Upper Assam; LPG bottling and distribution facilities; lube oil plant with 100,000 tons/year capacity at a site still to be determined; and if economically desirable an £8 million oil refinery.

#### German Benzole Refining Process for Austria

The Austrian State-owned ferrous metals producers Vereinigte Oesterreichische Eisen- und Stahlwerke AG, Linz, have ordered a plant for the catalytic refining of 2,300 tonnes/month of crude coke oven benzole. The plant, to work to the German B.A.S.F.-Scholven process, will be built and delivered by Heinrich Koppers GmbH, Essen, Federal Germany. This will be the first B.A.S.F.-Scholven unit in Austria. Also ordered from Koppers is a continuously operating redistillation plant for the production of high purity benzene and toluene. The complete plant is to be ready for operation by 1963.

#### Melamine Plant Planned in Spain

Hidro-Nitro Española, of Spain, have been authorised to install a plant for the production of melamine at their factory at Monzón de Río Cinca, Huesca. Work is scheduled for completion within two years.

#### India Postpones Tariff Hearing on Caustic Soda

Date for the Indian Tariff Commission enquiry into caustic soda has been postponed from 12 September to 15 September.

#### Further S.B.A. Ammonia Plant for U.S.S.R.

A contract for the supply of an ammonia producing plant has been placed with Société Etudes et Recherches Industrielles (E.R.I.) in Brussels by the Soviet trading organisation Techmashimport. The process to be used is that of Société Belge de l'Azote et des Produits Chimiques du Marly (S.B.A.) of Liège, Belgium, who will co-operate with E.R.I. on the project.

Techmashimport has previously placed an order with E.R.I./S.B.A. for two ammonia producing plants, now in the course of construction.

#### Vinyl Fluoride Monomer Plant for Du Pont

A \$3-\$4 million vinyl fluoride monomer plant is being constructed by E. I. du Pont de Nemours at Louisville, Ky. Production will be used for making the company's Teslar polyvinyl fluoride film at Buffalo, N.Y.

#### Soviet Pharmaceutical Plants for India

September will see the delivery of the first shipments of equipment for the construction in India of five pharmaceutical plants from the Soviet Union. The plants are those of the recently formed Indian State company Indian Drug and Pharmaceuticals Ltd., New Delhi, and the first two of them are expected to come into operation in 1963. India will herself erect necessary buildings and power units.

#### U.S. to Invest in Argentine Citric Plants?

The Argentine Ministry of Economy has received an investment proposal from the U.S. of \$10 million in machinery, equipment and cash for the installation of a plant producing citric acid, with an annual capacity of 8,000 tons.

Another U.S. investment proposal amounting to \$152,940 in machinery and equipment for another plant manufacturing citric acid, with a capacity of 500 tons a year, has also been received.

#### Anti-trust Suit Against Carbon Dioxide Producers

The U.S. Department of Justice has filed a suit in the Federal Court charging Air Reduction, Chemetron, Olin Mathieson and the Liquid Carbonics Division of General Dynamics with price fixing on carbon dioxide and rigging of bids to Government agencies.

#### Petro-naphthalene Plant for Texaco

Texaco have announced plans for a 100 million lb./year naphthalene plant based on petroleum feedstock at their Port Arthur refinery. The new plant, the fifth petroleum-based naphthalene unit in the U.S., is expected to be on stream early in 1963.

#### Merger Planned for Cities Service-Columbian Carbon

Cities Service, who have just brought on stream a new *o*-xylene plant, and who have a new contract to supply helium to the U.S. Department of the Interior,

have approved a merger with Columbian Carbon through a pooling of interests. In addition to world-wide carbon black production, Columbian Carbon have extensive interests in oil and gas. Cities Service have a 55% interest in Petroleum Chemicals Inc.

#### Shell Plan Lube-oil Plant in Singapore

Shell Lubricants Blending Co. (Singapore) are constructing plant for the production of 100 grades of lubricants in Singapore. Capacity is expected to be 7 million gall./year and the plant should be on stream by the end of 1964.

Shell Bitumen Manufacturing Co. (Singapore) are building plant to produce 75,000 tons/year, which should be in production by the end of this year. LPG will be produced at the Pulau Bukom refinery.

#### 100 Million Lb. P.V.C. Plant for Cary

A 100 million lb./year p.v.c. plant is to be built by Blaw-Knox for Cary Chemicals on a site near Burlington, N.J. First stage of the \$4 million plant will come on stream with a capacity of 50 million lb. by the middle of next year; second stage should be in production a year later.

#### New German Interest in India

A new chemical plant is to be built near Calcutta, with a production value of Rs10 million a year. The works will be operated by a specially formed company, Dr. Paul Lohmann (India) Ltd. Technical aid and financial support will come from the West German chemical firm of Dr. Paul Lohmann Chemische Fabrik. Exact nature of the plant's proposed production programme is not as yet known.

#### U.S.S.R. Orders Propylene and Rayon Plants in Japan

On the occasion of the Soviet Trade Fair in Tokyo last week, the Soviet authorities have ordered from Japan a propylene plant with an annual capacity of 10,000 tonnes, two rayon plants with an annual capacity of 24,000 tonnes, an acetate unit with an annual capacity of 7,000 tonnes and a sodium-vaporising unit.

#### U.S. Loans for Honduras Chemical Projects

The Inter-American Development Bank has approved a loan to Químicas Dinant de Centroamérica of Tegucigalpa, Honduras, to help finance the installation over five years of a plant for the manufacture of detergents, soap powders, disinfectants, industrial chemicals and other products.

#### U.S. Polystyrene Price Increase

The Rexall Chemical Co., a division of Rexall Drug and Chemical, has raised the price of polystyrene by one cent a lb. to 19 cents in bags and 17½ cents a lb. in bulk hopper car shipments. The changes are effective from 15 September.

● **Dr. Harold H. Zeiss**, formerly of Monsanto Chemical Co.'s Research and Engineering Division, has been elected president and director of Monsanto Research S.A. of Zurich, Switzerland, effective 1 September. He has been on leave of absence from Monsanto since last year as a senior fellow of the National Science Foundation, and has been lecturing and serving as a guest professor at the Universities of Munich and Heidelberg, West Germany.

● When the four new assistant managing directors of Castrol Ltd. take office on 1 January, they will be succeeded in their present executive positions by: **Mr. K. C. McCarthy** as general manager of Castrol Division (Mr. J. A. V. Watson); **Mr. W. F. Phillips** and **Mr. R. Alyet** as general managers, Overseas Division (Mr. L. G. Packham); **Mr. E. E. Hughes** as sales manager, Castrol Division (Mr. C. E. R. Millidge), and **Mr. K. E. Shurey** as group publicity manager (Mr. A. A. Barr).

● **Mr. A. E. Brown**, managing director of British Tar Products Ltd., Sheffield, since June 1947, is retiring at his own request on 30 September. He will continue to serve the company, which he joined on its formation in 1916, on a consultancy basis.

● **Mr. A. C. Sturney**, who has been appointed a director of the International Nickel Co. (Mond) Ltd., is succeeded as general manager of publicity by **Mr. L. F. Denaro**, formerly assistant to the manager director.

● **Mr. L. Bottomley** has been appointed technical director of Croxton and Garry Ltd. He joined the company in 1958 and has been instrumental in developing the use of the company's range of fillers and extenders for the p.v.c. and rubber industries in the U.K. He was formerly with the technical departments of the Dunlop Rubber Co. Ltd., at Manchester and Walton, and the sales and applicational research departments of Monsanto Chemicals Ltd.



L. Bottomley      T. P. Hughes

● **Dr. T. P. Hughes**, who has been appointed joint assistant managing director of B.B. Chemical Co. Ltd., Leicester, was formerly director of research of Tube Investments Ltd.

● **Dr. John Haslam, F.R.I.C.**, of 22 Great North Road, Stanborough, Welwyn Garden City, who retired recently as chief analyst of the I.C.I. Plastics Division after 33 years service, will now

## PEOPLE in the news

be available for advisory work in connection with the training of analytical chemists, the equipping of analytical laboratories and the solution of general analytical problems.

● **Mr. A. R. Milne** has been appointed a managing director of I.C.I. Fibres Division jointly with **Mr. E. B. Abbot** and **Dr. F. J. Siddle**. For health reasons Dr. Siddle will retire from the division board at the end of this year. **Mr. C. N. Harries** has been appointed a commercial director (overseas) and **Mr. D. N. Marvin** has been appointed commercial director (home) of Fibres Division.

● **Mr. B. J. Etherington** has been appointed marketing manager of H. J. Elliott Ltd., manufacturers of glassware and thermometers. For the past eight years he has been associated with the laboratory and scientific industry in his capacity of export manager to Electro-thermal Engineering Ltd.

● **Mr. Hector D. Walker** has retired from the board of Constructors John Brown Ltd. as from 1 September. He will continue to be associated with the company as a consultant and as a director of the C.J.B. subsidiary companies—Automatic Control Engineering Ltd., and Corrosion and Welding Engineering Ltd. In accordance with company retirement policy, **Mr. R. M. Wynne-Edwards** has relinquished his appointment as joint managing director, but will remain on the board. **Mr. J. A. R. Staniforth**, formerly joint managing director, will be managing director.

● **Mr. C. E. M. Cheetham** has been appointed managing director of William Blythe and Co. Ltd., Accrington, Lancs.

● **Sir Norman Kipping**, director-general, and **Mr. John Whitehorn**, deputy director (overseas) of the Federation of British Industries, will visit Japan from 4 to 21 October.

● **Mr. A. L. Hadfield** last week relinquished his executive duties with Anchor Chemical Co. Ltd., Manchester, at his own request. He will continue as a director.

● **Mr. A. E. Peel** has been appointed a director of British Oil and Cake Mills Ltd.

● **Mr. H. W. Magee** has been appointed petrochemicals representative for Gulf Oil Corporation and its subsidiary, Transocean Chemical Co. with offices in Milan, Italy. Mr. Magee has been in London as special representative—European activities for the Petrochemicals Department of Gulf. In his new assignment, he will provide technical and business liaison for Gulf Oil and Transocean Società Italiana Resin Gulf, a newly formed joint company which is constructing a plant to produce phenol on the island of Sardinia (see C.A., 29 July, p. 166).

● **Mr. Timothy John Benn** has been appointed to the board of directors of Benn Brothers Ltd., publishers of CHEMICAL AGE and other trade and technical journals. A great-grandson of the late Sir John Williams Benn, Bt., the founder, Mr. Benn joined the company when he came down from Cambridge having taken a degree in economics and history. His first appointment was with *Printers Sales and Wants Advertiser* and recently he became advertisement manager of *The Newspaper Press Directory*.



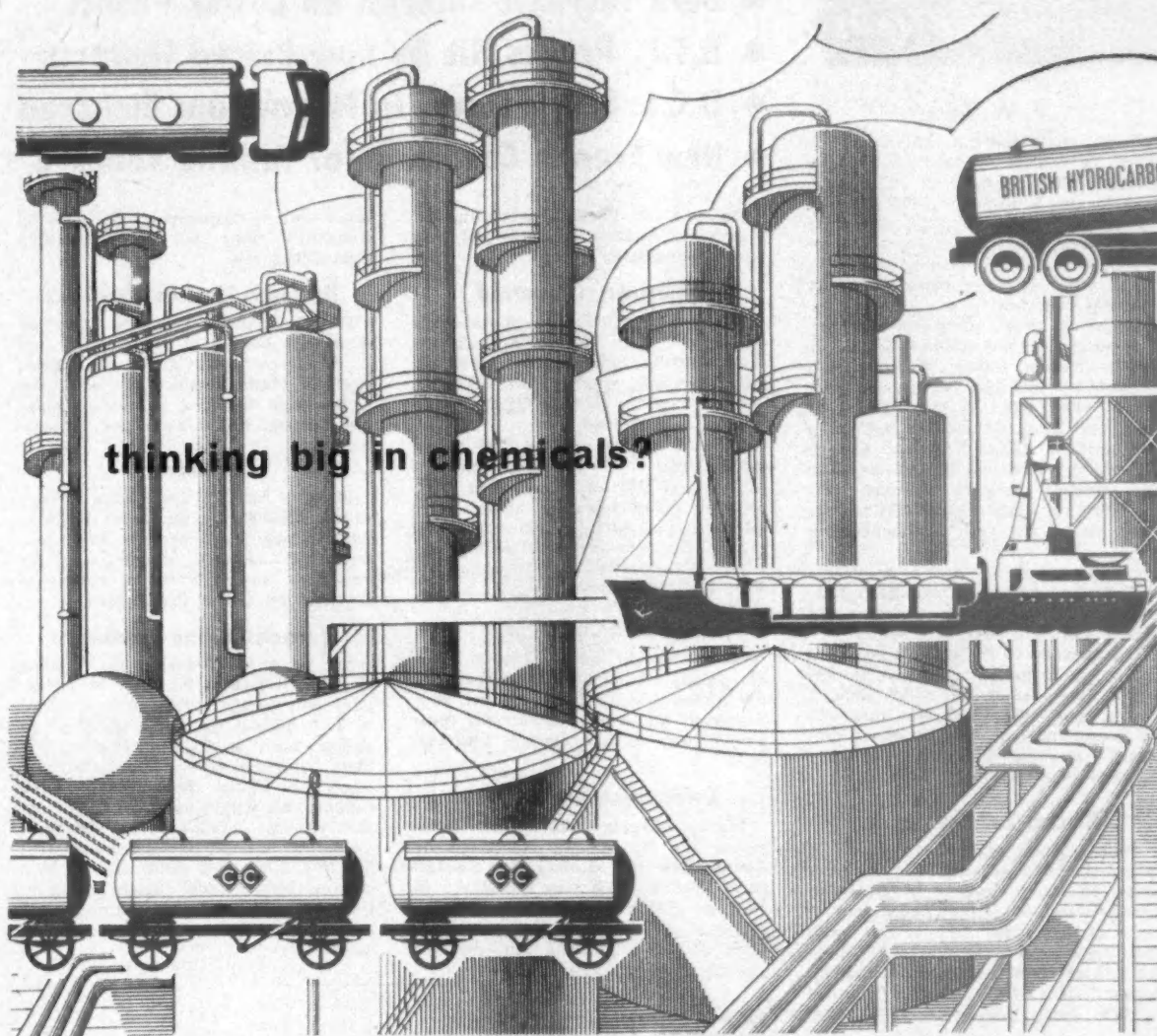
T. J. Benn      W. C. d'Leny

● **Mr. W. C. d'Leny**, who has been appointed chairman of I.C.I. Billingham Division in succession to Mr. W. J. V. Ward, who died on 10 August, joined the Billingham organisation in 1926. He became the Billingham Division research director in 1951 and in 1958 he was appointed joint managing director (technical).

Mr. d'Leny joined the Billingham organisation in June 1926 and in 1929 was appointed deputy research manager of the Nitrogen Division, later in the same year becoming group manager of the coal oil plant. This marked the beginning of his close associations with one of the major developments in the history of the Billingham Division—the successful establishment of a large-scale process for the manufacture of petrol from indigenous coal—and in 1942 he became oil works manager. In 1948 Mr. d'Leny joined the board of the I.C.I. Central Agricultural Control. He became the Billingham Division research director in November 1951 and in March 1960 he joined the boards of Richardsons Fertilizers Ltd. and Ulster Fertilizers Ltd.

● **Mr. J. Angus** has been appointed Scottish area representative of Q.V.F. Ltd., Stoke-on-Trent glass chemical plant and pipeline manufacturers. He will be responsible for handling laboratory service contracts in Scotland and will be based at 142a North High Street, Musselburgh.





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## Commercial News

### F. W. Berk

F. W. Berk and Co. Ltd. have declared an interim dividend of 2½d. per ordinary share, subject to income-tax, payable on 3 October 1961, on the capital as increased to £2,050,000. The Board stress that the increase in the interim dividend is only intended to reduce the previous disparity, between interim and final dividends.

Subject to audit, consolidated profits, after all charges but before taxation, for the six months ending 30 June 1961, amount to £366,894, which compares with £367,653 for the same period of 1960. This figure includes the half-year's profits of St. Albans Sand and Gravel.

Turnover, excluding St. Albans Sand and Gravel Company Limited, was £4,744,000 as against £4,509,000 for the same period last year (an increase of 5.2%).

Profits earned by Berk's Associated companies, Abbey Chemicals Ltd., Detarex Ltd., and Spencer, Chapman and Messel Ltd., are very satisfactory.

The directors of F. W. Berk comment that the lower profits for the six months to 30 June reflect the more difficult trading conditions which now exist and the considerably increased costs of running the business, without corresponding increases in sales prices.

### British Tar Products

Trading profit and other income of British Tar Products Ltd. for the year ended 31 March declined by £4,566 to £116,845, due to general uncertainty of trade in the latter part of the year. Depreciation took £28,001 (£25,000). A net sum of £26,645 was spent on capital account. Tax took £3,265 more at £35,048. Final dividend of 10% makes 15%.

In his annual report the chairman, Mr. F. Woolley-Hart, says the company has to face narrowing margins due to cheap chemicals produced on the Continent, particularly from East Europe, as well as penal taxation and the determined efforts of the coal industry to promote solid fuel burning. However, he views the longer term position with reasonable optimism.

### Magnesium Elektron

The 40% interest held by the Distillers Company Ltd. in Magnesium Elektron Ltd., Britain's only producers of magnesium metal, has been purchased by the British Aluminium Co. Ltd. Magnesium Elektron are now a fully-owned subsidiary of British Aluminium, who are controlled by Tube Investments Ltd. More than half of the magnesium output is used in the production of aluminium alloys with a substantial use in the production of uranium and titanium. As stated in 'Project News,' Magnesium Elektron are planning a new 5,000 tons/year plant at Hopton, Derbyshire.

- Berk Increase Interim on Lower Profits
- B.T.P. Profits Hit By Low-Priced Imports
- D.C.L. Sell Interest in Magnesium Elektron
- New French Company for Aniline Venture

Major C. J. P. Ball, who founded Magnesium Elektron in 1936, will continue as chairman.

### American Cyanamid

Second-quarter 1961 sales of American Cyanamid Co. were \$152,724,000 (\$145,401,000). Sales in the first six months of 1961 totalled \$300,907,000—within 2% of the record \$305,154,000 in the first half of 1960.

Reduced earnings for the 1961 period (\$23,732,000 or \$1.11/share compared with \$28,437,000 or \$1.34/share) were primarily attributable to some lower sales prices as well as higher research expenditures and increased selling and advertising expenses on a world-wide marketing programme.

### Baird Chemical

Baird Chemical Industries, New York, are making a cash bid for the shares of the Barlow Chemical Corporation, producers of quaternary ammonium compounds and tertiary amines, Ossining, N.Y.

### Koninklijke Zout-Ketjen

The two merging Dutch chemical companies NV Koninklijke Nederlandsche Zoutindustrie and Koninklijke Zwavelzuurfabrieken v/h Ketjen NV (C.A., 10 June, p. 954) have announced that the exchange of both companies' shares for those of a joint holding company will

begin on 14 September. The holding company's name will be Koninklijke Zout-Ketjen NV.

### National Plastics Products

Enjay Chemical Co., the chemical marketing division of Humble Oil, and J. P. Stevens and Co. are to acquire National Plastic Products and will form a new joint company to operate under the National Plastic name and management.

### Pfizer

Pfizer of the U.S. are making a bid—worth £720,000—for the shares of Globe Laboratories, Fort Worth, Tex., producers of vaccines, serums, etc., for veterinary uses. The bid is subject to approval by Globe shareholders.

### French Aniline Producer

Soc. pour la Production de l'Aniline et de ses Dérivés is the name of a company now set up in Paris with a capital of Fr.7 million for the erection of an aniline plant in Carling, France. The State coal-mining company Charbonnages de France hold 50% of the capital and Kuhlmann and their subsidiary, Cie. Française des Matières Colorantes together the remaining 50%. The new company's plant, adjacent to a carbon chemical unit already in operation, will start production next year with a capacity of 600 monthly tonnes, to be doubled later.

## Market Reports

### OVERSEAS DEMAND IS MAINTAINED

**LONDON** Trading conditions in general have been fairly active and with one or two exceptions the flow of new business from the main consuming industries has been satisfactory for the period. Overseas demand covering a wide range of chemicals has been maintained at about recent levels.

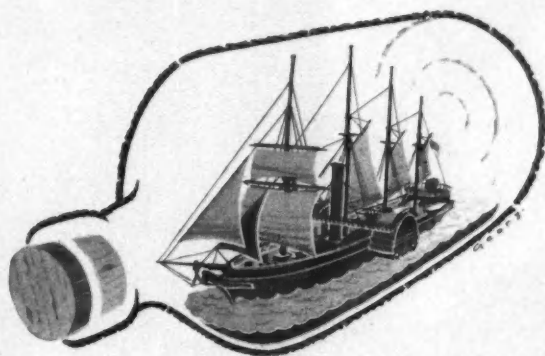
Prices for the most part are steady and the undertone is firm. There has again been little change in the market for agricultural chemicals and among the coal tar products a fair enquiry has been reported for the light tar products and for creosote oil.

**MANCHESTER** With the approaching end of the holiday season, traders on the Manchester market for chemicals and allied products are looking for an early improvement in business, which has been at a seasonably low level. In the meantime, the call for contract deliveries of the potash, soda and ammonia compounds, as well as for a wide range

of other products, has been on a fair scale, with fresh buying, much of it for prompt delivery. Prices generally are well held. The shipping movement is said to be reasonably satisfactory. In the market for fertilisers the compounds, as well as basic slag and the nitrogen materials, continue to attract attention.

**SCOTLAND** There has been a welcome increase in demand from practically all consuming trades calling for the usual range of alkalis, acids, and general chemicals, both for delivery against spot and forward requirements. Prices have remained firm and the general feeling is that a satisfactory week's trading can be recorded.

The agricultural trade in general is enjoying the usual seasonal demand but unfortunately, as far as export is concerned, there has been a noticeable falling-off in some of the chemicals which up until a short time ago had been enjoying a good demand.



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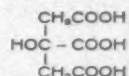
THE MISSING LINK IS SO OFTEN TO BE FOUND THROUGH THE VERSATILE **PFIZER ORGANIC ACIDS**

#### CITRIC ACID

Non-toxic — excellent sequestrant — one of the most versatile of industrial organic acids — efficient cleaner for ferrous and non-ferrous metals — successfully used in pre- and post-operational power plant cleaning and radio-active decontamination programmes.

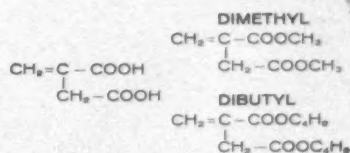
Citroflex\* esters are gaining a reputation as efficient, non-toxic plasticisers.

\*Trade Mark



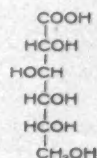
#### ITACONIC ACID

Low toxicity — reactive monomer — carboxyl groups can add adhesion, stability and solubility to copolymers. Other itaconic monomers (dimethyl and dibutyl) commercially available.



#### GLUCONIC ACID

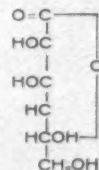
Non-toxic — outstanding sequestrant in caustic solutions — low corrosion rate — extremely useful in formulation of metal cleaning compounds for rust removal and paint stripping. Also used in electroplating and other industrial sequestrant applications.



#### ERYTHORBIC ACID

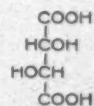
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## Benn Journals Give Remarkable Service to British Trade and Industry, Says Chairman

THE sixty-fifth Annual General Meeting of Benn Brothers Ltd., publishers of trade and technical journals and directories, was held on 31 August at Bouverie House, Fleet Street, London E.C.4.

The following are extracts from the statement by the Chairman, Mr. Glanville Benn:

Remarkable to relate the Company's year was uninterrupted by printing stoppages, violent price changes or other of the alarms and excursions that have become almost commonplace since the war. Further convulsions of volcanic proportions occurred among the proprietorship of newspapers and periodical groups but the continued independence of others, such as this Company, shows that the giants do not yet own all, or the best, of the British Press.

In the event shareholders may feel that the results amply justify the cautious prophecy of improvement made here a year ago. Further improvement in the new year now begun may not follow. While the earning power of the Benn journals and directories continues steadily to grow, further increases in printing charges have to be faced from September.

While earning profits for the shareholders and more tax than ever for the Chancellor, the Benn journals and directories again gave remarkable service to British trade and industry in its drive for home and export business.

A subscriber to *The Hardware Trade Journal*, for example, reads this weekly for its basic news and trade intelligence. In addition he knows that invaluable "extras" are at his service, such as the astonishing Enquiry Service or the 28,000 references in the *Register of Trade Names*. "Astounding" is the correct word. From 1 July, 1960, to 30 June, 1961, the Benn journal Enquiry Services handled 46,000 questions, 3,450 of them from overseas. When it is remembered that most U.K. enquiries are by telephone, the significance of the export total is emphasised.

Bouverie House's world-wide connections were strengthened and extended by much travelling. Nine Editors and Managers visited 11 countries, attending trade fairs, international conferences, or at the invitation of the manufacturers concerned to see new plants and machinery.

In 1956 we took a lead among publishers of trade and technical journals of our size in joining the Audit Bureau of Circulations. We welcome the decision earlier this year of eight more concerns, representing 97 publications, to become members of this organisation.

To make individual mention of each Benn journal and directory would be to risk becoming tedious. The following

notes record a few changes or developments that are typical of what has been happening throughout the business.

A completely new format was introduced for *Nursery World* at the beginning of January. The change was well received by readers and advertisers alike. Both have reacted favourably to the higher standard of production. Advertisement revenue of this weekly for the six months January-June was up by 20% compared to the same period in the previous year.

The continued improvement in presentation and layout of *Printers Sales & Wants Advertiser* has made a considerable impression in the printing industry resulting in many more of the larger suppliers to the trade now advertising regularly. Advertisement revenue increased by 33½% from 968 pages plus 14 insets for the year ending 30 June, 1960, to 1,235 pages plus 22 insets for the year ending 30 June, 1961—up, that is, by 267 pages and eight insets.

The 110th edition of *The Newspaper Press Directory* set up records in all departments. The book has increased in size over the last 10 years, from 600 pages to its present 940, and now covers the Press of nearly all countries in the world. Advertisement revenue reached an all-time record. The secretariat of the Royal Commission on the Press referred to the files of the Directory in preparation for its sittings.

The British chemical industry, in which production is expanding at twice the rate of industry generally, is served by *CHEMICAL AGE*. During the year this journal published a survey of production expansion projects in this vital sector of industry. This survey revealed capital expenditure, either made or planned in 1960, of £200 million, a figure that has since been widely quoted in the national Press.

The Benn group is equipped to play a leading part in the expansion of our export trade on which so essential an emphasis is now being placed. Apart from the circulation overseas of every one of our publications, *The British Trade Journal* which is wholly devoted to export business celebrates its centenary in two years time. The Spanish and Portuguese editions of *Industria Britanica* are the only foreign language journals of their kind catering for the vast markets of Latin America, Spain and Portugal, and in the directory field *Directorio de Industrias Britanicas* and *Benn's Far East Directory*, with its Chinese section, are pioneers in this field.

The year's trading may be considered satisfactory. The results have been achieved by a hard working and very expert team, some 375 strong. My personal gratitude is due to each and every one of them.

## TRADE NOTES

### Laundry Chemical

An illustrated booklet dealing with the application and advantages of Arquad 75, the laundry processing aid, has been produced by Armour Hess Chemicals Ltd. Arquad 75 is a cationic chemical which is claimed to speed up and improve laundry operations. Copies of the booklet and further information are available from Alcock (Peroxide) Ltd., Leicester Road, Luton, Beds, Hardings (Pendleton) Ltd., New Thomas Street, Pendleton, Manchester 6, and Charles Tennant and Co. Ltd., 214 Bath Street, Glasgow, C.2.

### ABRAC Publications

Two publications have recently been introduced by A. Boake Roberts and Co. Ltd., London, E.15. They are a new edition of 'Aromatics and fine chemicals catalogue,' and a new booklet on their range of standard aromatics produced from pinene.

### Plastic Igniter Cord

I.C.I. Nobel Division have produced a new edition of their publication, 'Plastic igniter cord.' It is a more comprehensive edition than the first in that it covers not only the use of plastic igniter cord in quarries but also in metalliferous mines.

### Retention Aid for Fillers

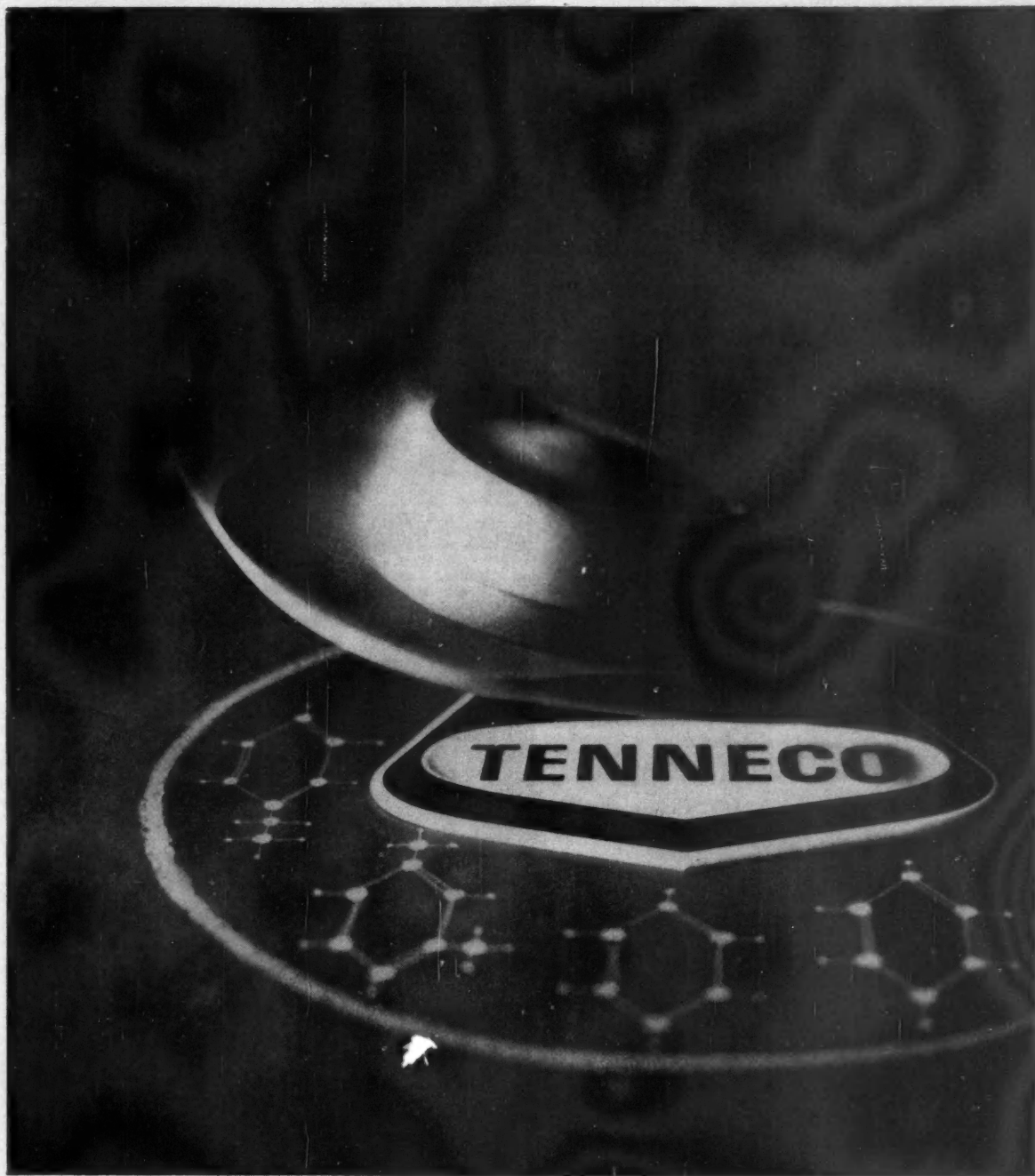
An addition to the range of the General Chemicals Division of Cyanamid of Great Britain Ltd., Bush House, Aldwych, W.C.2, is Accurac 24, a polyacrylamide-based retention aid specially developed to work on the paper machine over a wide range of pH. It is claimed that the new product gives greater retention of fillers and expensive pigments such as titanium oxide, the same colour specification with less pigment added, retention of fines for improved formation on the sheet, less fines in white paper and faster machine drainage.

### Durez Price Reductions

From 1 September 1961 prices of the following Durez alkali-soluble resins for floor polishes, produced by Omni (G.B.) Ltd., have been reduced: No. 15325 lump resin, No. 15467 lump resin, No. 15546 ground resin, No. 17211 ground resin, No. 19551 ground resin, No. 19788 ground resin. Full details of the new prices, samples and data sheets as well as copies of the new Durez Polishes handbook can be obtained from Omni (G.B.) Ltd., 35 Dover Street, London W.1.

### Thermocouples

The Cambridge Instrument Co., 13 Grosvenor Place, London S.W.1, have issued a new publication (List 325) describing their standard range of rare- and base-metal thermocouples for temperatures up to 1,500°C. The publication gives details of the factors governing the choice of suitable assemblies for widely differing applications, and describes a simple three-letter coding system which simplifies the ordering of stock assemblies and replacement parts.

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Specifications filed in connection with the acceptances in the following list will be open to public inspection on the dates shown. Opposition to the grant of a patent on any of the applications listed may be lodged by filing patents form 12 at any time within the prescribed period.

## AMENDED SPECIFICATIONS

On Sale 27 September

Cyclopentanopolyhydrophenanthrene compounds. Merck & Co., Inc. 826 364

## ACCEPTANCES

Open to public inspection 4 October

Process for refining alkyl sulpho-chlorides. Farbenfabriken Bayer AG. 878 845  
Polymerisation of ethylene. Grace & Co., W. R. 878 756

Process for preparing 1-cyanobuta-1,3-diene. Knapsack-Griesheim AG. 879 654  
Cyclopentanophenanthrene compounds and process for the manufacture thereof. Syntex S.A. [Divided out of 879 100.] 879 101, 879 102

Saikylic acid derivatives. Nippon Shinyaku Co. Ltd. 878 603  
Manufacture of steroids. Upjohn Co. 878 759

Process for improving the affinity for dyes of shaped polyolefin articles. Soc. Rhodiacheta. 878 760

Polymerisation process. Solvay et Cie. 878 979  
Thionophosphinic acid esters. Farbenfabriken Bayer AG. 879 821

Preparation of polymers from formaldehyde. Stamicarbon N.V. 879 022  
Polymeric composition. Montecatini. 879 198

Steroids of the pregnane series. Soc. Farmaceutici Italia. [Divided out of 878 693.] 878 694

Process for separating olefins. Esso Research & Engineering Co. [Divided out of 874 507.] 878 762

Organic platinum bearing liquids. International Nickel Co. (Mond) Ltd. [Divided out of 878 821.] 878 822

Open to public inspection 11 October

Recovery of radioactive isotopes. United Kingdom Atomic Energy Authority. 879 831  
Heat-stable silicates, their preparation and uses. Monsanto Chemicals Ltd. 879 572

Oxidation of polyoxyalkylene compounds. Scientific Design Co. 870 652  
Hypochlorite treatment of light hydrocarbon oils. British Petroleum Co. Ltd., and McNeill, E. 879 653

Preparation of substituted triphenylethylenes. Richardson-Merrell Inc. 879 792  
Acid addition salts of 2-dimethylaminoethanol and central nervous system stimulant compositions containing them. Riker Laboratories Inc. 879 259

Process for removing sodium chloride from aqueous caustic soda solutions. Farbenfabrik Wolfen Veb. 879 944  
Production of hydrogen peroxide. Laporte Chemicals Ltd. 879 839

Process for the manufacture of keto-steroids. Ciba Ltd. 879 872  
Stable aminoplast precondensation products and process for preparing them. Farbwerke Hoechst AG. 879 873

Production of synthetic elastomers. Imperial Chemical Industries Ltd. 879 773  
Process for the manufacture of compounds containing nitrogen and sulphur. Leuna-Werke W. Ulbricht Veb. 879 374

Anthraquinone dyestuffs. Farbenfabriken Bayer AG. 879 240  
Production of boron compounds. Imperial Chemical Industries Ltd. 879 241

Polyether-polyacid products and method therefor. Union Carbide Corporation. 879 950  
Production of alumina. Anasconda Co. 879 449

Compounds useful in the production of reserpine and related alkaloids. Sandoz Ltd. 879 951  
Stabilisation of ethylene polymers. Monsanto Chemical Co. [Addition to 796 285.] 879 691

High impact strength polymeric products and process for their preparation. Montecatini. [Addition to 835 578.] 879 907  
Metal-organic salt-amine complexes and their use in hydrocarbon oil compositions. Esso Research & Engineering Co. 879 991

Production of alcohols. Imperial Chemical Industries Ltd. 879 242  
Esterification of aromatic carboxylic acids. Standard Oil Co. 879 799

Mono-azo dyestuffs of the benzene-azo-naphthalene series and metal complexes thereof. Compagnie Francaise des Matieres Colorantes. 879 321  
Reduction of metallic oxides. Aspegren, O. E. A. 879 664

Process for the manufacture of tertiary alkylamine phthalazones. Deutsches Hydrierwerk Rodleben Veb. 879 954  
Anthraquinone dyestuffs and their use. Geigy, AG, J. R. 879 947

Phthalocyanine pigments and their use. Geigy, AG, J. R. 879 291  
Reinforced plastic. Mendip (Chemical Engineering) Ltd. [Addition to 798 398.] 879 243

Process for the production of ethylenediamine. Soc. D'Electro-Chimie, D'Electro-Metallurgie et des Acieries Electriques D'Ugine. 879 292  
Purification of maleic anhydride. Monsanto Chemical Co. 879 549

Ion-exchange processes and plants. Permutit Co. Ltd. 879 834  
Alkanic acids and salts thereof. Geigy, AG, J. R. 879 576

Phthalocyanine dyestuffs containing epoxide or alpha, beta-halogenhydrin groups and process for their manufacture. Ciba Ltd. 879 244  
Mono-azo dyestuffs containing halogenoacryl groups. Imperial Chemical Industries Ltd. 879 263

Dyestuffs containing triazine residues. Farbenfabriken Bayer AG. 879 578  
Preparation of 1,4-cyclohexanedimethanol. Eastman Kodak Co. 879 264

Manufacture of highly polymeric polymethylene terephthalates. Imperial Chemical Industries Ltd. 879 265  
Process for sulphochlorination of solid ethylene polymers. Solvay et Cie. 879 963

Manufacture of polymeric materials. Imperial Chemical Industries Ltd. 879 517  
Process for the purification of ketene. Wacker-Chemie GmbH. 879 964

Lead fluorocarbonate compositions and their use as polymerisation catalysts. Du Pont de Nemours & Co., E. I. 879 245  
Plasticisation of synthetic copolymers. Esso Research & Engineering Co. 879 694

Stabilisation of hydrocarbon polymers. Monsanto Chemical Co. [Addition to 796 285 and 879 691.] 879 695  
Pigment dyestuff preparation for colouring synthetic resins and rubbers. Farbwerke Hoechst AG. 879 587

Composition and method for stabilising trichloroethylene. Sicedison S.p.A. 879 882  
Substituted styrenes. American Cyanamid Co. 879 246

Process for the reaction of halogen-containing organic aluminium compounds with olefins. Ziegler, K. 879 269  
Production of alcohols. Newby, H. (Chemische Werke Hüls AG.). 879 803

Process for producing water-insoluble azo-dyestuffs on shaped structures of aromatic polyesters, especially of polyethylene terephthalates. Farbwerke Hoechst AG. 879 742  
Polymers derived from phenols and unsaturated acetals. Union Carbide Corp. [Addition to 865 196.] 879 419

Production of aliphatic carboxylic acids. Imperial Chemical Industries Ltd. 879 591  
Production of benzothiadiazines. Abildgaard, K. 879 592

Manufacture of alkali metal phosphates. Knapsack-Griesheim AG. [Addition to 799 429.] 879 594

Pharmaceutical preparations containing 6-chloro-7-sulphamyl-3,4-dihydro-1,2,4-benzothiadiazine-1,1-dioxide. Ciba Ltd. 879 881, 879 882

Catalysts containing alumina and process for the preparation thereof. Nalco Chemical Co. 879 273  
Method of preparing a diphenyl-methane derivative. Industria Chimica Profarmaco S.r.l. 879 247

Organosilicon compounds. Imperial Chemical Industries Ltd. 879 439  
Holoamino aromatic compounds. Diamond Alkali Co. 879 436

Vinyl ester synthesis. Grace & Co., W. R. 879 274  
Polymeric compositions. British Resin Products Ltd. 879 597

Therapeutic compositions containing erythromycin. Abbott Laboratories. 879 420  
Process of preparing carboxyalkyl cellulose ethers. Hercules Powder Co. 879 524

Gasification of solid carbonaceous fuels. Inland Steel Co. 879 275  
Steroids. Soc. Farmaceutici Italia. 879 622  
Oxidation of polychlorotoluene to polychlorobenzoic acid in the presence of inorganic acids. Heyden Newport Chemical Corp. 879 818

Production of magnesium hydride. Olin Mathieson Chemical Corp. 879 230  
1-Nicotinyl azetidines. Lepetit S.p.A. 879 833

Production of conjugated diolefins. British Hydrocarbon Chemicals Ltd. 879 624  
Polymerisation process. Imperial Chemical Industries Ltd. 879 625

Derivatives of thiophene, their production and uses. Ciba Ltd. 879 610  
Manufacture of linear polymers. Chemstrand Corp. 879 820

Secondary amines and method for preparing same. Ciba Ltd. 879 342  
Water-soluble monoazo dyestuffs containing acryloylamino groups and their production. Badische Anilin- & Soda-Fabrik AG. [Addition to 858 183.] 879 925

Basic dyestuffs and their production. Badische Anilin- & Soda-Fabrik AG. 879 885  
Separating iso-olefins. Petro-Tex Chemical Corp. 879 727

Process for the manufacture of isoprene from 4,4-dimethyltetrahydrofuran. Institut Français du Pétrole des Carburants et Lubrifiants. 879 728  
Cationic aminoplast resin compositions. Nopco Chemical Co. 879 821

Irradiated petroleum resin and liquid polymer. Esso Research & Engineering Co. [Addition to 831 842.] 879 627  
Phosphinic acid compounds and preparation thereof. American Cyanamid Co. 879 930

Determination of sulphur in a gas stream. Esso Research & Engineering Co. 879 931  
Process for the preparation of a light hydrocarbon oil freed or substantially freed from mercaptans. Shell Internationale Research Maatschappij N.V. 879 731

Catalyst for the production of formaldehyde from methanol. Montecatini. 879 888  
Process for the production of borohydrides. Farbenfabriken Bayer AG. 879 446

Process for making lower oxidation products of phosphorus. Knapsack-Griesheim AG. 879 734  
Polyamides with improved flow properties. Badische Anilin- & Soda-Fabrik AG. 879 424

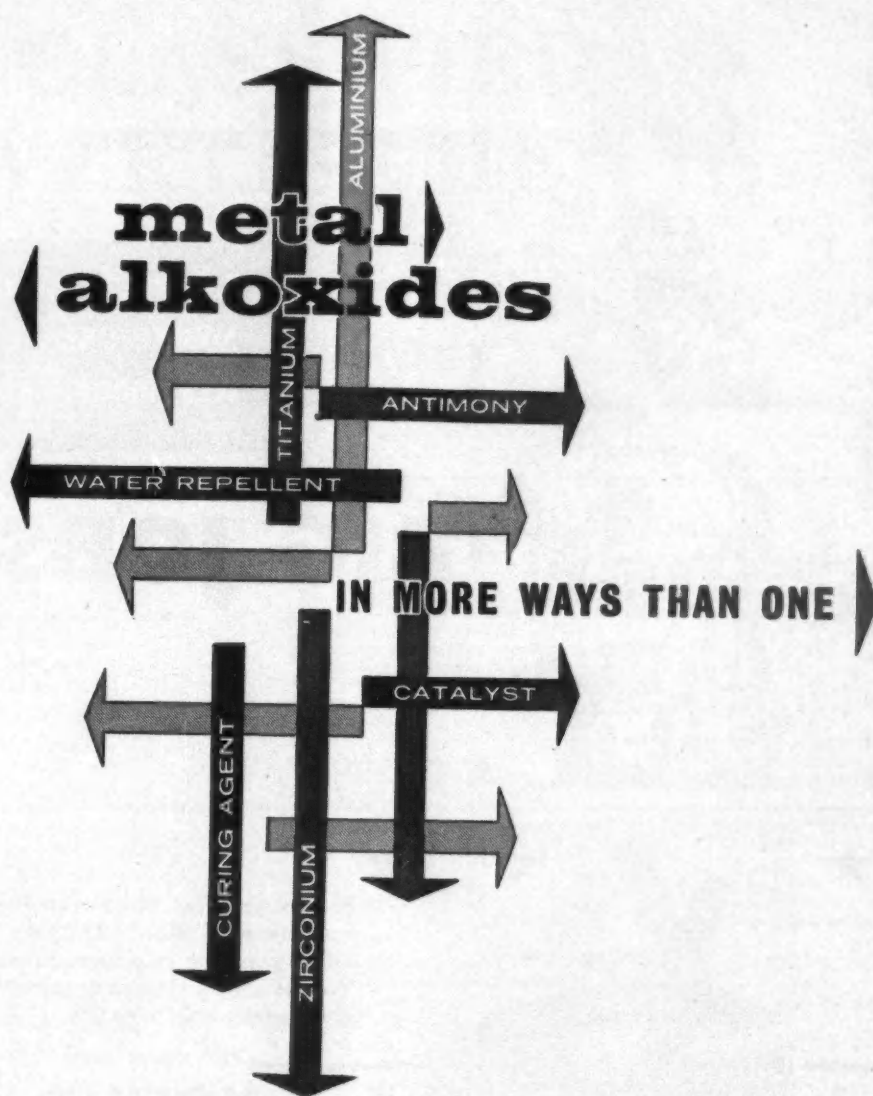
Process to manufacture copolymers of mono omega-amino alkyl urea with methylene radicals having different number of carbons. Toyo Kasei Industries Inc. 879 932  
Stable 6-dimethyltetraacycline antibiotic compositions. American Cyanamid Co. [Addition to 845 454.] 879 629

Process for the preparation of beta-ether-substituted propionaldehydes. Shell Internationale Research Maatschappij N.V. 879 555  
Heterocyclic substituted hydroxylated steroids. American Cyanamid Co. 879 234

## DIARY DATES

THURSDAY 14 SEPTEMBER

S.C.I. London—Royal Society of Medicine, 1 Wimpole St., W.1. Food Group. 2 day Symposium on 'Recent advances in processing cereals'.



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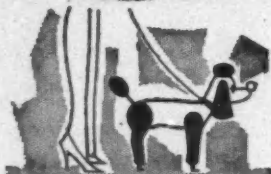
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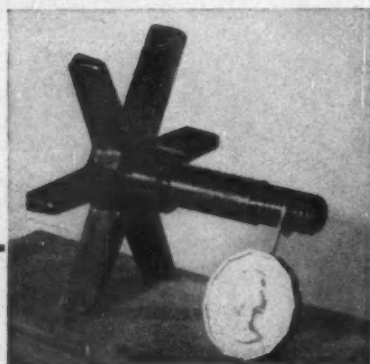


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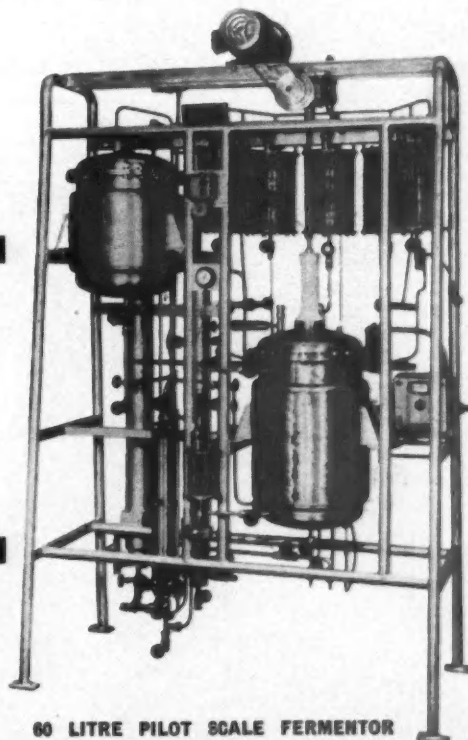
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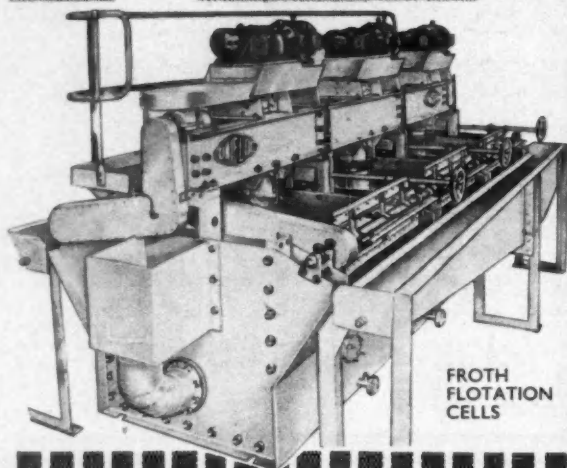
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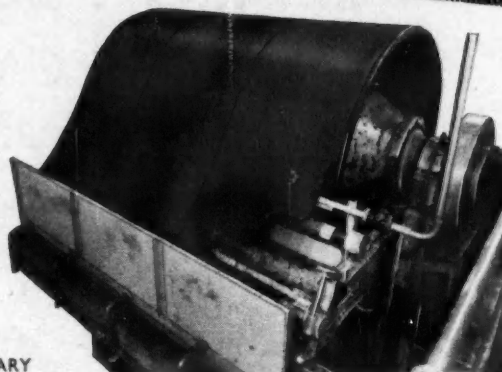
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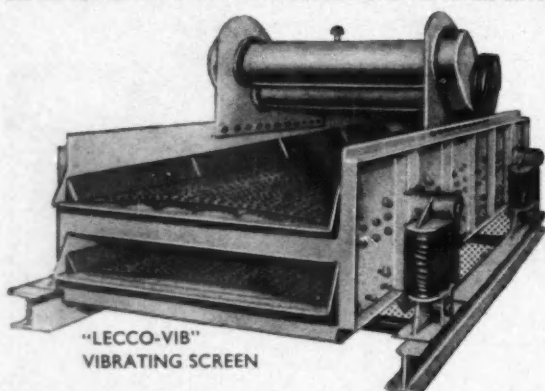
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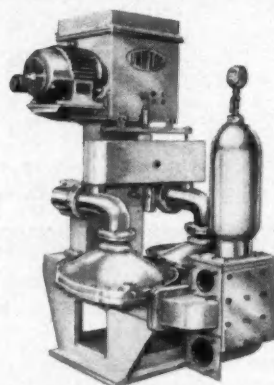
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